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PORTER'S PROGRESS OF NATIONS

CHILE

PORTER'S PROGRESS OF NATIONS

CHILE

AN ACCOUNT OF ITS WEALTH AND
PROGRESS

BY

JULIO PEREZ CANTO

(CHIEF EDITOR 'EL MERCURIO,' SANTIAGO)

WITH AN INTRODUCTION BY

ROBERT P. PORTER

AUTHOR OF 'THE TEN REPUBLICS', 'THE FULL RECOGNITION OF JAPAN,' ETC.

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CHILE: ITS WEALTH AND PROGRESS

BY JULIO PEREZ CANTO

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'To point out the progress of the nation—not of this or that section of its inhabitants, but the progress of the whole social system in all its various departments, and as affecting all its various interests—is the object proposed, while the means employed for its accomplishment will, as far as possible, be sought for in well-authenticated facts, and the conclusions which these suggest will be supported by principles the truth of which has in general been recognized by common consent.'

(From The Progress of the Nation, by George Richardson Porter [1836-43].)

INTRODUCTION

I

THE AIMS OF THE AUTHOR

THE immigrant from Great Britain whose first glimpses of Chile show him a warship named O'Higgins and a street called after Cochrane cannot but feel that the strangers among whom his lot has been cast are prepared to accord him a genuine welcome. He sets out upon his new career with the consciousness that men from his own distant islands have met with success and that their services have been honourably commemorated by those for whom they worked.

And if he is undecided in what part of the New World to make his home, he is inevitably drawn • towards the people who are proud to style themselves the English of South America. Among them, at

8 THE AIMS OF THE AUTHOR

any rate, he can acquire property and live his own life with little sense of expatriation. And the same applies to the citizen of the United States.

It is with the object of supplying immigrants and investors with trustworthy information that *Chile—its Wealth and Progress* has been written. The author being Mr. Julio Perez Canto, chief editor of *El Mercurio* of Santiago, no further evidence is required of his competence for the task he has undertaken, and a glance at his pages will testify to the lucidity, thoroughness, and impartiality with which he has carried it out.

The last-mentioned quality calls for recognition: in setting down his estimate of the situation and of the prospects of his country Mr. Perez Canto has issued a sober record of facts. One sometimes hears the South American style referred to as extravagant and rhetorical; here will be found nothing to support any such contention; 'good wine needs no bush,' and Mr. Perez Canto is content for the most part to let his subject speak for itself. Anglo-Saxon readers, for whom this book is intended, will not find themselves, as might otherwise have been the case, repelled by an attitude of mind into which they cannot enter; on the contrary, they will feel attracted to a country where their own methods of expression are understood and appreciated.

Mr. Perez Canto's work was written in Spanish, and the exact and conscientious translation is the work of Mr. Edward Gill, whose rendering has preserved the spirit of that language ; at times we seem to recognize the sonorous quality of the original tongue.

In Mr. Perez Canto's account of Chile there will be found, in the smallest possible compass, a description of the physical characteristics of the country and of the industries which have been developed there. He has given those details which are indispensable for the business man, but he has devoted little space to the political history of Chile and to her relations with the neighbouring republics. The explanation lies in this : the different nations among whom South America is now distributed have so much of their past in common that the editor of the South American Series, of which *The Wealth and Progress of Chile* forms a part, decided to save repetition by recounting the general history of the continent in a prefatory volume. This introduction, entitled *The Ten Republics*, deals with Latin America from the standpoint adopted by the writers of the separate histories ; and it contains, moreover, comparative data which should assist the investor to estimate the progress made by the different nations. Comparisons have been avoided by Mr. Perez Canto ; as a Chilean he has judged it

expedient to let others point the lessons of his country's history, although no man is more sensible of their importance. Indeed, for a person who contemplates emigrating to a foreign land, or engaging in trade there, it is not sufficient to know that its mountains are rich in copper, that its soil yields wheat in abundance, and that steamers compete for its coal. It is well that this should be so, but the demand for copper may cease, large areas nearer the consumer's markets may be thrown open to wheat, oil fuel may be substituted for coal, and then the prosperity of a country whose staple industries are thus threatened will depend on the energy and adaptability of its people. To appraise its possession of these qualities it is necessary to know how it has faced the trials of the past, and how it bears comparison with nations which have been confronted with similar problems. It is no more possible to understand the aspirations of Chile without some familiarity with the history of South America than to ignore the influence of England in writing about the United States : modern Chile is the child of Spanish Chile.

In his suggestive chapter on the Progress of Chile Mr. Perez Canto has referred to the importance of the subjects which the plan of this volume has compelled him to pass over. Some of these have been dealt with in *The Ten Republics*, and it is the

aim of the next few pages to bridge over the gaps between that general account of South America and the description of modern industrial Chile to which Mr. Perez Canto has been obliged to devote most of his space.

The geographical features of Chile are fully described in the first chapter, which calls for no addition. Those, however, who are repelled by the scientific terms, without which no accurate record can be conveyed, may be interested to hear that in shape Chile is a long narrow trough, of which the southern extremity might be found near New York if the northern could be placed in Queenstown. It would, however, be unwise to roll luggage down it from Ireland to America, for the ridge on the coast side of the trough is too irregular to afford protection. Seen in a bird's-eye view by one of her own condors; Chile must appear like the shorter end of a Neapolitan ice—three oblong patches, each of a different colour; to the north the dull yellow of the desert, to the south the green of the forests, with a variegated patch in the agricultural district of the centre.

The length of the country between its northern and southern extremities, when taken in connexion with the great height maintained by the backbone of mountains, accounts for the varieties of temperature dealt with in a later chapter. This physical

formation will at once prepare the reader to find that Chilean products are many and various ; nor will he be surprised to learn that the vast geological disturbances which piled up the Andes in times past have furnished the country with numerous deposits, the value of which can only be guessed at. Mr. Perez Canto thoroughly recognizes the importance of this aspect of his subject, and has supplied geological information which should be of much value to the chemist and the mining engineer. In this connexion it may be emphasized that in spite of the diversity of climate Chile is nowhere dependent upon negro labour ; the supply of white immigrants has indeed been small, but those who have traversed the dreary miles of sea, which have been so potent a factor in retarding the development of the country, have thriven and multiplied in their new home.

Mr. Perez Canto has much to say of interest about the rivers ; of these it is the character rather than the magnitude which calls for notice. The request to name a Chilean river might be too much for Macaulay's schoolboy ; and the reason is not far to seek. Since Chile runs down to the Pacific in a short steep slope, the rivers have little room between their mountain source and the sea to develop, so to say, to man's estate. Hardly have they recovered from their headlong plunge from the heights before the

ocean claims them. Here none of those stately waterways are to be looked for which are a feature of the eastern plains. One conceives the snow cornices of the watershed moralizing on the inequalities of destiny when falling westward under the inexorable power of gravitation ! Of the streams condemned to cross the desert many perish in the sands ; in the agricultural districts the rivers reach the sea, but it will be noticed that Mr. Perez Canto speaks of shoals and bars ; here the ocean-going steamer will find no Rio de la Plata to bear her inland. But the rivers of the centre in a humble way have done their country much service and will yet do more. Water for irrigation has been drawn from them in unfailing quantities, and they have furnished means of transport when no other existed. And a time will come when they will be called upon for the mechanical power which they can undoubtedly supply. In a country which does not produce enough coal for its needs the consequences of such developments can hardly be overestimated. Nevertheless, some will be found to regret that the tinkling streams which differentiate Central Chile so pleasantly from the stern country around it should be harnessed to the factory and the railroad !

‘That its characteristics may be appreciated, Chile should be approached from that part of

Argentina known as the Gobernación del Neuquen. Arid, with little vegetation and no game, the country grows colder and bleaker, until the icy ridges of the Andes have been surmounted ; but once the snow-line has been left behind the character of the landscape changes. The green trees, the flowers, and the waterfalls invite the traveller to dismount, and the gay scenery below suggests to him a pleasant mental picture of the land he has entered upon—its bracing mountains, its fertile valleys and its three thousand miles of territorial seas.’¹

In the south the wet west sea-winds on striking the cold Andes deposit an enormous amount of moisture ; the rivers, in consequence, are full and rapid, and they thus acquire such powers of erosion that in places they have cut their way through the mountains. This characteristic is of more than geographical interest, for it was responsible for the famous watershed controversy between Argentina and Chile.

A treaty was made in 1881 between the two republics to settle long standing boundary difficulties in the country now under discussion. It was agreed to take as the frontier the line of the highest peaks of the Andes and the line of the watershed ; and it was assumed that these lines coincided. North of Patagonia no difficulty arose :—

¹ *The Ten Republics*, by Robert P. Porter

'Here indeed the fundamental condition of identity between the "highest crest" and the "water parting" existed in full force. . . . It was the divergence of these two essential conditions in Patagonia which imperilled the peace of South America. The Patagonian rivers were found to flow from east to west right athwart, or transverse to the general trend of the Andine mountain system from north to south. They were found to break across the great mountain masses and to intersperse wide valleys across which the boundary must either be carried from one mass of peaks to the next or else be made to skirt the indefinite ridge of Cordillera and pampas where the two insensibly combine and where the rivers rise. A very little examination proved the incompatibility of "highest crests" with "water partings" as a fixed principle of demarcation in these parts.

'There are small lakes and marshes discharging in both directions ; there are glaciers sitting astride the "divortium" and there is one (and perhaps the most remarkable feature of all) where a river, for some thirty miles of its course, contains the actual water parting of the continent.'¹

Thus the river system of the south was responsible for an extremely dangerous situation. The boundary question had been for many years a source of friction between the Argentines and the Chileans. Both were extremely sensitive about their national honour;

¹ Sir T. H. Holdich, *The Countries of the King's Award*.

both were ready to shed their blood to defend it ; in agreeing to accept a scientifically defined boundary both thought themselves to be making sacrifices. When, then, each found the other declining to accept the evidence of the rivers, the limit of its forbearance was reached by either party.

Ultimately the dispute was referred for arbitration to King Edward, but not before Argentina and Chile had spent vast sums in purchasing warships and in creating, organizing and maintaining large armies.

It is sometimes argued that all this money was wasted, but, as Sir Thomas Holdich points out, it purchased more than money can buy. Patriotism was aroused ; a feeling of solidarity was engendered ; and the young men of both countries were trained in the fighting services to the value of system and discipline—qualities seldom conspicuous in a new country. And the long and careful explorations which the work of demarcation necessitated will more than repay their cost when the time comes to build roads and railways through a country of which much was unknown when King Edward's boundary commissioners entered upon their task. We may surmise that to them is due much of the information so ably summarized by Mr. Perez Canto.

But if there was a good side to a peril which made each country put its house in order, war would

have been an unmitigated disaster for both. The territory in dispute was of little value. Financial chaos would have followed, and the rival nations would have been deposed for a generation from the leading positions they now hold in South America. Neither could have counted on victory.

Moreover, the acceptance of arbitration did more than save Chile and Argentina from material losses ; it raised both in the eyes of the world to a position unattainable through conquest. By the self-control they exhibited they proved themselves to have emerged from their minority, and it may well be that their example will deter the older nations from hurried appeals to arms. If so, in their fierce rush to the sea the Patagonian rivers will have done the world some service.

Mr. Perez Canto's description of physical features is followed by a short historical sketch, in connexion with which the reader may be recommended to read the first chapter of *The Ten Republics*.

It may be mentioned here that the political connexion between Chile and Perú preceded the Spanish conquest. In the middle of the fifteenth century the Incas crossed the Atacama desert, penetrated to the river Maule and asserted their authority over a considerable portion of what is now the republic of Chile. As soon as the Spaniards

had seized Perú, Almagro made a famous prospecting expedition to the southward ; he also reached the Maule, whence he returned empty handed. It is worthy of note that the hardships he had endured in his outward march over the mountains induced him to return through the Atacama desert. The wealth he sought was within his grasp, had he but known it ! ‘ The captain would not easily be found at this day who would venture to lead his army across this dreary region ’ says Prescott ; a remark worth quoting as indicating the spirit of the Spaniards from whom the South Americans are descended.

In discussing the later development of the country by the Spaniards, Mr. Perez Canto several times speaks of ‘ encomiendas ’, a term which calls for some explanation, for the system to which it was applied was evolved from a compromise between morality and expediency such as all colonizing nations resort to.

From one of his expeditions Columbus returned with a cargo of Indians whom he proposed to sell as slaves ; Queen Isabella intervened and ordered that they should be set at liberty and sent home ; thus was inaugurated in Spain a campaign for the liberation of the Indians. The existence of these humanitarian projects deserves mention ; if they are disregarded, less than justice is done to the Spanish

colonial system, little that was good can be found in it, and that little often escapes readers dazzled by the appalling cruelties of the 'conquistadores'. Nor is it the tendency of the modern republican historian to lavish praise on Old Spain. Spain bestowed serious consideration upon the Indian problem. 'The declaration that the Indians were to enjoy the privileges of free subjects provoked opposition not only from the colonists but also from the colonial officials and even from the clergy. Without a certain amount of compulsion, however, the native could not be induced either to perform a sufficient amount of work to meet the requirements of the colonies, or to remain on a permanently friendly footing with the settler ; yet this was indispensable if the civilizing influences and more especially the conversion of the natives to Christianity, which had, from the commencement of the history of discoveries, been so strongly emphasized, were to be carried on with success. For this reason both the temporal and spiritual authorities were unanimous in declaring that the grant of unlimited freedom to the natives would mean the ruin of the colonies from both a spiritual and an economic point of view. The *Repartimientos* and *Encomiendas* were the final result of the negotiations which were carried on with regard to these matters. The personal liberty of the

natives was therein specially recognized, but, in order to promote their education by European methods of civilization and to secure their conversion to the Christian doctrine, they were assigned ('repartir') to the charge of individual colonists and placed under their protection ('encomiendar').¹

For the Indians a state of bondage resulted ; the well-meant efforts of Spain did not suffice to protect them from cruel treatment, and their lot has been a sad one. On the other hand there is this to be said for the system of Latin America ; in dealing with races like the Indian, other colonizing nations have not bettered the Jesuit system of despotic benevolence, nor have they amalgamated so successfully with the aborigines. In Chile, as elsewhere in South America, a new and strong type has been built up. Here, at any rate, racial quarrels are not among the domestic problems to be solved.

Of the hard conditions of life in Chile and their effect on the national character something will be said in the next chapter. Great difficulties were encountered by the first settlers owing to the lack, or rather the inaccessibility, of precious metals and to the fierce resistance of the Indians ; moreover, there was little money forthcoming to meet the drain of the constant warfare. Nor was the Indian the

¹ Dr. H. F. Helmolt, *The World's History*.

only enemy. Although England and Chile were destined to be on terms of peculiar intimacy, this was hardly to have been anticipated from their early intercourse. To take one instance—the appearance of Francis Drake off the Chilean coast. He raided Valparaiso, but the loss that he caused was not so much material as moral and indirect. To a country whose land communications were so bad that an army could not be maintained in the field unless supplies could be sent by sea, a blockade of the coast made it almost impossible to cope with the Indians.

These descents of Drake and his fellow privateersmen from England were, of course, directed less against Chile than against Philip II; who—if the truth could have been realized—was the common enemy of both countries. Philip governed his South American possessions not in their own interest, but for the enrichment of Spain and for the prosecution of his own schemes. Of these the one nearest his superstitious heart was the destruction of protestant England. To obtain money for this pious object the bold Spanish colonists were taxed out of the fruits of their enterprise, and the Indians were driven in the mines until they died. It was the aim of Drake to intercept the stream of gold with which Philip equipped his armadas and so to cripple his designs. Chile, however, afforded Philip

little assistance, for the country was poor in the precious metals, and it was upon these that the Spaniards concentrated their attention.

None the less Chile—like the sister provinces—was stunted in growth by the regulations issued from Madrid. The British marauders might sail round the Horn if they pleased, but the Chilean trader was limited by law to the expensive Panamá route. As an instance of Spanish bureaucratic methods, it may be mentioned that the same restriction was enforced upon the colonists on the Plate ; many years elapsed before they were allowed to use their own great waterway in communicating with Europe ! By confining the trade to one route the Spaniards counted upon controlling it more easily ; and they were satisfied to make large profits on a small amount of merchandize. The consequences to colonial development may be imagined. Even the home government must have suffered, for the people could produce little and, though taxes were high, their yield was small. As a speculation the conquest of Chile did not pay Spain ; it is true that the Chileans grew corn for Perú ; but the cost of the Araucanian wars exceeded any profit thus arising. Mr. Perez Canto had not sufficient space at his disposal to do justice to the administrative improvements which ensued when the throne of Spain came to be occupied

by kings having French sympathies. A more intelligent system was adopted—trade was freed from many restrictions; agriculture was fostered; industry was encouraged and a university was established. This policy might have given satisfaction, had not two grievances remained unredressed; the 'criollos'—the local aristocracy—were embittered by the continued appointment of Spaniards to high offices; and the whole country suffered from the arrogance of the clergy. The original conquest, it must be remembered, partook of the nature of a crusade; much power was therefore given to the Church, and this was cast into the reactionary scale when a policy of reform was inaugurated. No great progress, therefore, had been attained when Napoleon made himself master of Spain, with consequences recounted elsewhere.

In the next chapter some account will be given of those events in his history which have moulded the character of the Chilean, and of the qualities which they have shown him to possess. Mr. Perez Canto's sober record will thus appear in its true significance.

II

THE CHILEAN

OF the early inhabitants of what is now Chile little that is trustworthy is known. The discovery of kitchen middens proves that in times past the southern districts supported man, but whoever he was, he has left so few records that for practical purposes history begins in the fifteenth century of our era. It was then that the Incas of Peru pushed their way southwards and established some sort of suzerainty over the Chilean tribes ; their authority is supposed to have extended to about the latitude of Santiago. As agriculturists they would have thought the vale of Chile more attractive than did Almagro, who followed in their traces. Both Inca and Spaniard found their progress barred by the Araucanians—the fierce tribes who dwelt south of the Bio-Bio river and maintained their independence within living memory. It is the Araucanian strain which primarily differentiates the Chileans from other South American peoples. The bracing climate, the struggle for existence, the absence of any admixture of negro blood—all these have had their effect ; but

one is probably justified in ascribing the toughness and persistence which peculiarly characterize the men of the south-west to the dogged race which withstood the invaders for so long.

In one respect the Araucanian was a savage ; he took little trouble to amass wealth and, as might be inferred, he showed himself deficient in the wealth-producing qualities : industry, obedience, application and so forth. But he was not so much a dullard as a philosopher ; he was content with what sufficed for his wants, and the grim story of the killing of Valdivia (whose mouth was filled with molten gold) indicates in his captors at any rate a contempt for the coveted metal. Cruel he was ; but not more so than the Christians who sought to dispossess him of his ancestral forests. The Araucanians were a nomad pastoral people ; they understood the value of organization at any rate for military purposes ; they could compute times and seasons and their religious beliefs were of a relatively high order. Their best known quality was their courage, but what stamps them as a superior race was their adaptability. They learned tactics from the Spaniards and soon profited by the knowledge that the old-fashioned musket took time to re-load. Beaten, they retreated where no Spaniard could follow, to reappear some dark night in some incautious settlement.

Twice they burned Concepción. But the details of their resistance to the power of Spain must not occupy us here. Its importance lies in the success that attended it. By the treaty of Quillin in 1640 the Spaniards left them the land to the south of the Bio-Bio river. It was not until 1870 that they recognized the authority of Chile. To-day they are amalgamated with their ancient foes in one virile race.

They brought more with them to the union than their indomitable courage. By preventing the Spaniards from taking peaceful possession of their country they influenced the character of the future Chilean nation—and influenced it for its good. The continual warfare, it is true, kept the population at a low level ; it was an obstacle to the mating of the Spaniard and the Indian ; it checked immigration, and it absorbed energies that might otherwise have been devoted to the development of the country ; but on the other hand, it forged a hard, patriotic, self-reliant people, and its demands had to be met by a steady influx of soldiers from Spain, a circumstance to which the Chilean owes his high percentage of white blood. It will be noticed that Mr. Perez Canto says ‘ The mass of the population of Chile is of pure European descent with traces of the aborigines, forming an homogeneous people with characteristics of the superior race ’.

In the greater part of South America during the colonial period the people were to be divided into five classes: Spaniards born in Spain, Spaniards born in the colonies, Indians, half castes, and negroes. In Chile, as will have been gathered, there were certain differences to be noted: the last class was absent; the fourth was less numerous than elsewhere; the proportion of soldiers was higher, and the Indians, instead of being cowed and submissive bondsmen, were warriors whose blood was little likely to emasculate any race. Under these circumstances it is not surprising that the part taken by Chile in expelling the Spaniards was out of all proportion to her population; it was largely with Chilean forces that San Martín and Cochrane conquered Perú and thus made South America independent.

When the destructive work of expelling the Spaniards had been completed the Chilean ceased to be a minor; he was now called upon to show his constructive capacity. It was no longer possible to attribute ill-success to the mismanagement of alien officials; Chile was now to become just what the Chilean could make of her.

For some years the attempt at self-government met with precisely that measure of success which might have been expected—that is to say it met with no success at all. There is this advantage in living

under a despot ; if individuals evade the burdens laid upon them, so much the better for them ; it is the despot's business to keep the machinery of state running ; if roads and bridges are allowed to fall into decay, and if brigands flourish, there is little wealth left for the despot to tax ; and so the despot, in his own interest, preserves some sort of order. But if for despotism there is suddenly substituted government ' by the people for the people ' it may well happen, since all taxation is unpopular, that there will be no central authority strong enough to exact the working expenses without which no community can be held together : until these new governors become educated, such taxes as are allowed to reach the treasury must be expended on popular objects ; and in the absence of some compelling force the public services languish.

At the time of writing (1911) the English papers are filled with complaints that the social programme of the radical party precludes a proper outlay on the navy : should the alarmists be right, the masses will suffer more from invasion than they have escaped in taxation. If these fears can be expressed, not without some show of reason, in a country grown old under slowly acquired representative institutions, what was to be expected from a young community which had suddenly shaken itself free from the swaddling bands

in which it had been tightly confined? Composed of heterogeneous and imperfectly amalgamated races, self-confident and inexperienced, the wonder is not that, in its first years of independence, it should have revealed little sense of corporate responsibility, but that in the short space of a century it should have secured the recognition so freely accorded by the older nations at the recent centenary celebrations.

The Spanish officials who had monopolized the chief posts under the colonial system were often idle and corrupt, but they had brought with them from Spain some knowledge of the routine of government; with their departure disappeared all administrative experience; their successors, for the most part, were either adventurers or publicists; from the former nothing good was to be looked for, and the latter were dangerous in proportion to their energy. To a country governed as Chile had been the peculations of a few professional politicians more or less were negligible evils; the people wanted rest while their undeveloped powers were gently stimulated; they were incapable of deciding—as they were called upon to decide—between the merits of different constitutions. It would have been an ill-constructed constitution indeed which could have caused more evil than did the civil disturbances which accompanied amendments. But the Chilean had learned from the

Araucanian wars the value of peace ; the rhetoric of the French Revolution, which is still in demand in some parts of South America, did not intoxicate him for long. He decided to sacrifice the ideal for the practical ; what he wanted was a strong government ; this he had failed to obtain from the Liberals whom the Revolution had left in power, and he now turned to the Conservatives. The latter promulgated the constitution of 1833 that, with certain modifications, is still in force to-day—from which circumstance it may be inferred that the Chilean knows his own mind. Much power was allowed to the executive, but the Chilean secured for a long period the stable and intelligent government of which he stood in need.

During the next half century Chile made steady progress—progress the magnitude of which can only be appreciated by comparing her with the sister republics ; but starting as she did so far behind the great powers in the race of nations, Chile had much ground to make up before approaching the leaders. A large proportion of her territory remained unproductive ; from the standpoint of Europe or the United States the means of communication were insufficient and ill-organized, to improve them would cost money, and money was hard to come by in a sparsely populated country. This deficiency in

the population was perhaps the most serious evil : the government endeavoured to remedy it by encouraging immigration from Europe, but it could not offer foreigners prospects attractive enough to outweigh the length of the journey. Thus lack of population and defective communications acted and reacted upon one another to keep the country poor ; if the people had been more numerous it would have paid to build roads and railways to assist trade ; and if roads and railways had made transport less costly, more of the country could have been used to advantage. At this period there seemed little probability of any rapid advance on the part of Chile. But then there came an intervention of 'the God from the machine', or, as an optimist would put it, that nation which deserved success ended by achieving it. The Chileans, fashioned by their hard upbringing into the hardest race in South America, had been quick to seize such opportunities of developing their resources as had come their way. When the grim northern deserts, which have figured so repeatedly in South American history, proved their hidden worth, the Chileans at once grasped the situation and prepared to profit by it, thus exhibiting one of those national characteristics which this introduction is written to indicate. Chile, however, has never been the spoilt child of fortune ; like Saturday's

bairn in the nursery rhyme, she has had to work hard for her living. The rich nitrate deposits of which the desert was composed lay for the most part beyond her frontiers—in the Bolivian province of Antofagasta, and in Tarapacá the southernmost part of Perú. The energetic Chileans poured across the borders, sank their capital in the new enterprise, and proceeded to do a lucrative trade. When the owners of the soil awoke to what was going on they acted as the late President Kruger acted towards the mining interests of the Transvaal. To develop the new industry called for foresight, vigour, and courage ; to bleed it white by taxation meant nothing more than the creation of a few new posts in the custom house—the very posts for nephews of politicians. The easy course was adopted ; unreasonable imposts were demanded, and then the Chileans disclosed another of their national characteristics—the ability to learn by experience. In their dispute of 1865 with Spain, the bombardment of Valparaiso had taught them that a nation with a long coast-line and no warships cannot afford to quarrel. They set to work, therefore,—scanty though their resources were—to build up a fleet. With a grasp of the international situation of which Bismarck would have approved, the Chilean statesmen recognized the crucial importance of the nitrate district and prepared

to fight for their place in the sun. They saw clearly that war was inevitable.

Bolivia proceeded with her policy of taxation ; it led to the seizure of the property of a Chilean nitrate company doing business in her territory. Chile sent troops to defend her national interests ; and thus a war broke out which merits some description because its result seems likely to have an incalculable influence on the development of three young nations. Future historians may regard it as we regard the wars epitomized by Marathon and the Metaurus.

But before entering into details it is desirable to say a few words about the object of contention, which was simply manure. This is no place to moralize upon the foundations of national greatness, but the product mentioned is of such local importance that it calls for mention. It has been to the west coast what coal has been to England. These barren shores have long furnished means for the raising of crops elsewhere ; their contribution recalls the story of the poor widow casting in her mite.

Long before the nitrate fields were recognized as valuable, the guano deposits of the Chincha Islands had been used for purposes of fertilization. Guano is the excrement in a certain state of decomposition of sea birds. How far this bald statement is from exhausting the interest of the subject will be gathered from the

following excerpt from Mr. H. J. Mozans's admirable work *Along the Andes and Down the Amazon* :—

‘ The Chincha Islands are small barren rocks, but it may well be doubted whether any equal area of the earth's surface has yielded a greater amount of treasure. They, from time immemorial, have been the home of the so-called guano birds—pelicans, sea-gulls, marine crows and cormorants—which have made those immense deposits, almost two hundred feet deep in places, that, for more than half a century, have supplied the world with its richest and most prized fertilizer.

‘ But this is only one of several groups of guano islands found all along this wonderful rainless coast from Los Lobos to Tarapacá. . . . New deposits are continually being made by the millions of birds that frequent these islands. To enable the reader to form some idea of the countless myriads of birds that congregate on these rocky islets for purposes of roosting at night or rearing their young, it suffices to state that no less than five thousand tons of guano are deposited annually on a single one of the Chincha Islands and that on an area not exceeding fifteen acres in extent.

‘ Although guano was extensively used as a fertilizer during the time of the Incas, it was practically lost sight of after the conquest until the time of Humboldt. Its true value, however, was not recognized until some decades later, when Justus von Liebig, the father of agricultural chemistry, definitely determined its importance as a fertilizer, and, at

the same time, demonstrated that it was one of the greatest assets of the republic of Perú. Had the Peruvian government adopted wiser methods in exploiting these valuable deposits, and enacted suitable laws for their conservation, and then employed the immense wealth accruing from the sale of guano in developing and building up a merchant marine and navy, she would to-day be, in proportion to her population, second to none of the republics of South America. It is only recently that she has enacted laws looking towards the preservation of her guano deposits. In doing this she has done little more than revive the old Inca regulations which enforced rotation in digging and protected the birds in closed seasons.

“In the times of the Kings Incas,” writes Garcilaso de la Vega, “such care was taken to preserve these birds, that it was unlawful for any one to land on the islands during the breeding season under pain of death, that the birds might not be disturbed or driven from their nests. Nor was it lawful to kill the birds at any time either on the island or elsewhere, under pain of death.”

‘This is one instance in which the Peruvians of to-day can learn from their Inca predecessors of four centuries ago.’

The suggestiveness of this extract must be the apology for its length. It will be noticed how a study of this prosaic commercial product, guano, throws light on historical and archæological problems. Here, once more, we see the gifts of the gods slipping

through the fingers of the languid Peruvian ; and the knowledge colours our feelings when he complains that he has been robbed of his nitrate. His case is a hard one, but it was no bad thing for the world at large that the nitrates should have been transferred to more appreciative possessors.

In this matter the attitude of the modern Peruvians suffers by comparison with that of the Incas whom they deposed. The latter were not contented with land which energy and enterprise could improve ; as has been seen they both used and conserved the guano of the islands ; from which it is to be inferred that the men of the mountains established relations with the maritime races of the coast who would alone have been capable of procuring it. But we are straying from our subject.

It is a curious coincidence that nitrate beds should have been discovered so close to those of guano, for both are valuable fertilizers. The explanation lies in the peculiar climatic conditions which have enabled both products to develop the properties which agriculturists look for in manure.

In the north of Chile the mountains are separated from the sea by a desert in the form of a plateau : except for an occasional oasis where some small river supplies moisture the district is dry and barren but rich in saline and mineral deposits. How these came

to be formed is a matter of conjecture. We learn from geology that the district in which they lie has slowly emerged from the sea in comparatively recent times. As it rose, it is suggested, the marine plants rose with it and then, from lack of moisture, slowly decayed into the fertilizing medium we are discussing. The extreme dryness of the climate calls for some explanation, for it is owing to this peculiarity that the decomposing vegetable matter has been preserved in a valuable form. The prevailing winds in this region are from the east; they sweep from the Atlantic over the eastern plains of South America and are deprived of their humidity in crossing the cold summits of the Andes; to them the narrow strip of coast on the west must not look for rain. And no help comes from the sea; the rainless coast is washed by a cold current from the Antarctic which leaves the sea winds with no moisture for the warmer shore. Out of these depressing conditions has been built up a great industry of which some description will be offered later.

This digression has been necessary to bring out the importance of the nitrate beds, to explain the ardour—one might almost say the ferocity—which marked the struggle for them; and especially to emphasize the capacity of the Chilean to make a great effort for a great object. As an agriculturist

of the west coast he well knew what the Chincha Islands would have been worth to him, and the knowledge coloured his feelings towards those who would exclude him from participating in the nitrate industry. Documents now in course of publication support the Chilean contention of having been provoked and compelled to fight; they show that, far from seeking war, they were not prepared for the struggle, and were obliged to take up arms to defend the rights of their countrymen.

The Chileans thus entered Bolivian territory in 1879 to protect the interests of their countrymen in Antofagasta; the Bolivians could make little resistance, and the brunt of the conflict had to be borne by Perú, which was united to Bolivia by a secret treaty. By the time Perú had declared war Chile was in possession of the ports of Bolivia and had thus secured a base of operations—indeed, all through the conflict Chile advanced from one position to another with a decision of purpose which showed that her plan of campaign had been carefully conceived.

The Chileans blockaded Iquique, and shortly afterwards took place two sea-fights which probably decided the issue. The Peruvians lost one of their two formidable ships by running her aground, and the other, the *Huascar*, was captured by superior

force after a gallant struggle ; with her went the chief hope of Perú.

To the countrymen of Captain Mahan and to the Englishmen whom he has reminded of the importance to their safety of sea-power the next steps are of interest. With the sea swept clear of the enemy, the Chileans were enabled to send transports and attack his scattered coast garrisons where they pleased. By this means they gained not only the Bolivian coast province, but also Tarapacá, which was part of Perú.

The next series of operations gave the Chileans possession of Tacna and Arica ; they then reorganized their forces, pushed on inexorably and captured Lima. Throughout the war they had shown themselves superior to their antagonists in strategy, tactics and morale, and the capacity for concerted action disclosed by their fleet and army came as a surprise even to their admirers.

The Chileans, successful in the hard fighting, were now called upon to show their patience and diplomacy. The struggle, as has been said, was fierce, and the Peruvians, who valued national honour as highly as their adversaries, were in no mood to yield until they could fight no longer. The fall of Lima did not, as one would have supposed, bring about the conclusion of peace ; like the fall of Moscow it did but embitter

the defenders ; organized opposition was no longer possible on the seaboard, but the stubborn Peruvians retired to the mountains and there maintained a determined resistance. It was impossible for the small forces at the disposal of the Chileans to dislodge them, and a deadlock resulted. The Chileans had no desire to maintain an army of occupation ; it cost money, and they could not shift the entire burden to their adversary, for they had already seized what she had of value ; moreover, they were anxious to devote themselves to the development of their new acquisition.

Realizing that Perú could not but desire to see their backs, the Chileans extricated themselves from their difficulty with considerable shrewdness. Perú, as was to be expected, was torn by political dissensions ; to one of the contending parties the Chileans accorded their support and with its leader they negotiated terms of peace which will be again referred to later. These terms included the cession to Chile of the nitrate district.

With the close of this war commences the latest stage of Chilean development. Previously Chile had distinguished herself from her neighbours by the greater solidity of her institutions ; henceforward she could also point to direct financial security when she appealed to the foreign capitalist. The nitrate

industry was harnessed, as it were, to the chariot of government; and was compelled to do a third of the work. The export duty which was placed upon its product enabled the Chilean treasury to dispense with or to diminish certain import duties and thus to stimulate trade. It is Mr. Perez Canto's province to show the commercial effect of these changes; here it must suffice to point out that, as trade has improved, greater facilities for communication have been demanded. The extensions completed and projected in the railway system indicate that the Chilean Government is in touch with the needs of the people, and that it is as well prepared to lead them to the triumphs of peace as to those of war. The new railways will do more than open up undeveloped and fertile districts in Chile; by enmeshing more of the population in the web of commerce they will emphasize the Chilean's belief in the value of order; moreover, they will give his combative instincts full play in the competitions of the manufacturer and the agriculturist. The water-shed controversy already referred to affords evidence that the necessary lessons have been learned; that adaptability of which the Araucanian gave so many proofs in the field of battle is still a national quality.

The conspicuous success which is analysed in *The Wealth and Progress of Chile* is the result—the

inevitable result—of the characteristics of the Chilean people ; and for that reason no set-back is to be apprehended. The Chilean has been content to hurry slowly ; having tasted of anarchy he acquiesced—in the Constitution of 1833—in the surrender of administrative power to those best qualified to use it ; the suffrage is still such as to leave the guidance of the nation to the classes which have most to lose by rash and ill-considered actions, but the tendency has been towards the ‘liberalizing’ of political institutions ; as the people become educated, they will automatically obtain their share of power. At present the governing class is the aristocracy, but the Chilean takes so keen an interest in public affairs that any abuse of authority would be fraught with extreme danger ; it is only fair to add that his political leaders as a class are too patriotic to incur risks of the kind implied.

They are fortunate in the people it is their duty to guide ; the backbone of the nation is the agriculturist, indeed, until recent times the small population of Chile was practically concentrated in the longitudinal valley of which so much has already been said.

A rich soil, a warm yet temperate climate and an inexhaustible supply of water from the mountains have combined to make the central district of

Chile remarkably fertile. The conditions are such that, while hard work is called for, it is amply rewarded by kindly nature. As a consequence the patient Chilean peasant has developed into an agriculturist to whom no class of farm-work comes amiss: he is equally skilful in raising crops or in handling stock, and he and his fellows will survive to make the Chilean race formidable, even if certain dismal forebodings should be realized and the mining classes should disappear with the exhaustion of the mines.

It was inevitable that the men of the centre should devote themselves to agriculture and to stock-raising; it was also inevitable that Chile should breed sailors. Magellan was not the first to cleave the Southern Pacific. Long before his famous voyage its waters had borne the frail skiffs of the natives of the coast. Some of the aborigines of the south were so markedly maritime in their habits as to be called 'canoe Indians'. Indeed they had to fish to live; not only were they penned between the mountains and the sea like all the inhabitants of Chile; but the narrow strip of land that intervened was, in their case, covered with forest-clothed bogs and marshes; animals could not subsist in them nor—if they had done so—could hunters have found foothold. The men of Chiloé and the neighbouring

coast are sailors by inheritance, a fact which explains the victories of Cochrane. Sir Edward Grey may have been thinking of the peasants and fishermen of Chile when, in congratulating her on her peaceful policy, he added that no one would attribute it to weakness.

III

THE STRANGER WITHIN THE GATES

IN the last chapter an attempt was made to show that the progress of Chile had been due to the characteristics of the Chilean ; some reference must now be made to the assistance which he derived from helpers of other nationalities. The Spanish conquest was not the work of Spaniards alone ; when Pizarro sent home tidings of his prize, there came flocking to his banner soldiers of fortune from all countries—from Italy, from Germany, from the Netherlands. With the establishment of a settled government the opportunities of aliens diminished ; the Spanish authorities were chary of permitting their own countrymen to settle in the new colonies, and they regarded foreigners with the greatest suspicion. ‘South America for the Spaniards’ was their policy, and in furthering it they did not hesitate to impose restrictions which stunted the development of their possessions. The attempts of the smugglers and buccaneers to evade these restrictions make one of the most interesting chapters in the history of the continent, but they need not detain

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us here, for Chile, being poor and inaccessible, presented no great attractions to these adventurers. Yet if the foreigner could not force himself upon Chile with a cutlass, he undermined the authority of the Spanish officials with more dangerous weapons. The doctrines of the French Revolution and the Declaration of Independence of the North American colonies opened the eyes of the Chileans to the character of the government under which they lived. When they threw off the yoke of Spain they put an end to the restrictions which were a feature of her policy. Nothing had galled the 'criollos' more than the system of reserving all high places for Spaniards born in the Peninsula; indeed, one of the first uses to which the Chileans put their liberty was to throw open such places not only to their own countrymen but to foreigners. In the war of independence they were content to follow San Martín and Cochrane, who were neither of them Chileans. The deeds of the former make part of the general history of the struggle, but those of Cochrane are the peculiar glory of Chile.

Thomas Cochrane, tenth Earl of Dundonald, was born in Lanarkshire in 1775. He rose to a high position in the British Navy only to lose it on a charge that was afterwards shown to be unfounded. Before his dismissal from the service he had made

for himself an international reputation as a leader of unparalleled daring and resource, and it was not long before he accepted an offer from the insurgent Chileans to organize and command their naval forces.

It was characteristic of Cochrane's energy and self-confidence that he undertook a task for which, as he must have known, his previous training in no way prepared him. It was one thing to lead to victory the disciplined sailors of a properly found British frigate such as his old vessel the *Impérieuse*; quite another to overcome the Spaniards with the improvised warships and undrilled peasants which were all his new masters could offer him. Fortunately these peasants turned out to be magnificent fighting seamen. Officered by men who could not speak their language, ill-armed and underfed, they grasped by instinct and carried out as a matter of course the most audacious schemes which Cochrane could conceive. The irascible Admiral passed his life in quarrelling, but he and his crews suited one another to a nicety; an orthodox leader would have asked for and obtained much less from his men, while experienced seamen would have supposed that impossibilities could not be performed by the unequipped. The term impossibility is the only one appropriate to some of the exploits with which Cochrane and his sailors assured the success of

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the revolution : the feats of arms which cost the Spaniards South America were comparable to those which had gained it for them.

Cochrane soon became such a terror to the Royalist forces that they entitled him *el diablo* ; warships—booms—fortresses—nothing was safe from Admiral Devil. Disappointment, far from daunting him, did but make him more dangerous. On one occasion he obtained rockets from the insurgent government and entered Callao bay in order to burn the shipping there. But the rockets would not catch fire ; they had been filled by Spanish prisoners who had taken care that they should be useless. Thereupon Cochrane planned to capture with his flagship alone ‘the numerous forts and the garrison of Valdivia, a fortress deemed impregnable’. It is in his own account of this project that he deems it advisable to assure his readers that ‘rashness, though often imputed to me, forms no part of my composition’. Some idea of the difficulties he had to contend against may be inferred from another passage :—

‘From excessive fatigue in the execution of subordinate duties I had laid down to rest, leaving the ship in charge of the lieutenant, who took advantage of my absence to retire also, surrendering the watch to the care of a midshipman who fell asleep.’

Cochrane awoke to find the flagship on a rock, five feet of water in the hold, the pumps out of order, the carpenter, 'only one by name,' and insufficient boats for the ship's company. 'Having some skill in carpentering' he took off his coat and mended the pumps, while the whole crew were set to baling out the water with buckets.

'To our great delight the leak did not increase, upon which I commenced heaving off the ship, the officers clamouring first to ascertain the extent of the leak. This I expressly forbade, as calculated to damp the energy of the men, whilst, as we now gained on the leak, there was no doubt the ship would swim as far as Valdivia, after which she might be repaired at leisure. . . . The powder magazine having been under water, the ammunition was rendered unserviceable, though about this I cared little, as it involved the necessity of using the bayonet. . . .'

The ship did swim to Valdivia, which was captured with all its munitions of war. The Spaniards were thus deprived of their chief stronghold in the south, while the moral effect of so daring and successful a raid was of the utmost value to the insurgents.

There is no room here to describe how Cochrane subsequently cut out the frigate *Esmeralda* from under the guns of Callao; his own account of that and many other exploits may be read in his *Naval Service in Chile, Peru, and Brazil*, a record of insurrec-

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tion, battle, and adventure in which an intrepid, unaccommodating, and contradictory character may be observed in situations most calculated to stimulate it.

In little more than two years he drove the Spaniards from the seaboard; that done, he laid down his command.

No one who reads Cochrane's autobiography can avoid noticing the kindness of his references to William Miller—a testimony of importance as coming from one none too easily satisfied. Miller was born in Kent in 1795; he entered the British army at an early age, fought in the Peninsula from 1811 to the close of the war, and afterwards took part in the battle of New Orleans. In 1817 he joined the Chilean insurgents, and was given first of all a post in the artillery and subsequently the command of the marines serving under Cochrane. If he had not had enough fighting before, he must surely have been satisfied now; for his knack of coming by hard knocks became proverbial. On one occasion he was terribly scorched and nearly blinded by an explosion; a little later he was so badly wounded in an attack on Pisco that his life was despaired of; nevertheless in discussing his Valdivia enterprise Cochrane says:—

‘I felt quite sure of Major Miller's concurrence

when there was any fighting to be done, though a ball in the arm, another through the chest passing out at his back, and a left hand shattered for life were not very promising incentives. . . .’

Miller had sufficiently recovered to lead the attack, and was again hit three times. But the Chilean navy did its work so well that there was soon no more to do. Miller was not the man to be left idle, and before long was soon fighting on land to such purpose that he became Chief of the Staff to General Bolívar. Appointed Colonel of cavalry, he distinguished himself at Junín and also at Ayacucho—the great battle that was fatal to the pretensions of Spain. Bolívar and San Martín vied with Cochrane in their eulogies of Miller’s character and of his services to the cause of the insurgents. In June 1834 he was made Gran Mariscal and afterwards Comandante-General of the Peruvian army. Then his own country claimed him and he was appointed British Consul-General in the Pacific. In 1859, being taken ill in Perú, he expressed the desire to die under the British flag. Accordingly he was transferred to H.M.S. *Naiad*, then in Callao Harbour, and it was on board of her that his death took place.

A career even more remarkable for the distance travelled between its lowly commencement and its brilliant end was that of Ambrose O’Higgins. Born

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in Ireland in 1720, his first occupation was that of errand-boy to Lady Bective; later he went to Cadiz, where an uncle charged himself with his education. He next emigrated to Perú, where he is first heard of as a small tradesman. He also worked at road-making, and it was to his skill in this capacity that his advancement was due. He became a military engineer, and was soon entrusted with high command in the Araucanian wars. He had now found his true vocation; his tact, humanity, and knowledge of human nature enabled him to maintain some sort of an understanding with the Indians, and his success was speedily followed by promotion. He continued to show administrative talents of a high order, and much of the ravaged country to the south of the Bio-Bio became habitable under his firm and kindly sway; it is interesting to note that his practical knowledge of road-making now stood him in good stead, for, like the Romans before him, he looked upon the road as an engine of civilization. Finally, in 1796, he was appointed Viceroy of Perú, and he held that magnificent position until his death, some ten years later.

Thus he attained almost kingly rank by his own unaided talents; at the same time, the ample recognition which was accorded to those talents in the person of a plebeian foreigner suggests that

historians have not always been just to the colonial system of Old Spain.

His gifts did not die with him, for he left a natural son, Bernardo O'Higgins, who became the first president of independent Chile. But Bernardo, who was born in Chillán, can hardly be classed as a stranger; and there is little need to refer to his services here, for they are chronicled at length in every account of the struggle for independence.

O'Higgins is not the only Irish name that is written in Chilean history. Patrick Lynch distinguished himself in fighting the Peruvians in the Nitrate War, and as for the sailor, Arturo Prat, who was killed in boarding the *Huascar*, Chile has no more popular hero. His defence of the wooden *Esmeralda* against the ironclad Peruvian; and his desperate attempt to capture the *Huascar* as she drew in to ram, have fired the national imagination. He and the *Esmeralda* are to Chile what Sir Richard Grenville and the *Revenge* are to England.

As the result of surveys made by English naval officers, English names are applied to many landmarks on the southern coast; it was then only to be expected that England would be concerned in the development of the sea communications of Chile, and we find that the first attempt to put an organized steamship service on the coast was made with

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English capital. The leading spirit in the enterprise was not, however, an Englishman, but William Wheelwright, a citizen of the United States of North America, to whose energy reference is made below by Mr. Perez Canto. What Wheelwright, with his Pacific Steam Navigation Company, did for the sea, a countryman of his, Henry Meiggs, did for the land.

‘From Ecuador to Patagonia, through Perú, Bolivia and Chile, Meiggs’ enterprises extended, and the result is a series of railroads at right angles with the coast connecting the interior of the country with the seaports and giving the estates and the mines in the mountains, the sugar haciendas and the nitrate beds easy outlets to the ocean. Nearly every port on the west coast has its little railroad from twenty to two hundred and fifty miles in length, some of them reaching into the very heart of the Andes, the arteries of the continent’s commerce, and intended to make profitable possessions which would otherwise have no worth.’¹

It will be gathered that there is much for which Chile has to thank foreigners, and foreigners, it may be added, owe a debt to Chile; who has allowed them to enjoy the fruits of their enterprise. They have still much good work to perform, but the Chileans are now developing their country themselves, directing their attention, particularly, to banking

¹ Curtis’s *The Capitals of Spanish America*.

and agency work. The French, of whom there were at one time many, especially in Valparaiso—are now less often seen, but the English and the Germans engaged in engineering and in industry are numerous and successful.

Some idea of the importance attached by the Germans to Chile may be gathered from *Deutsche Arbeit in Chile*, a volume published in Santiago at the time of the Centenary celebrations to call attention to the work being done by Germans. This is very fully described, but the English-speaking reader will take most interest in the chapters on colonization, which deal with the emigration problem and the attempts made by the Chileans to grapple with it. In the middle of the last century large bodies of Germans were brought out under the auspices of the Chilean Government and were landed in Valdivia, where they found no preparations made for them and all the land in private hands. The Indian chiefs had raised no difficulty about signing away their land—or indeed any one's land—for a small sum to speculators who had learned of the intentions of the Government. How the emigrants overcame these difficulties and made Valdivia a town where many Chilean-born citizens speak only German is a history in itself. The Chileans received them kindly when the situation was at its worst.

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‘Doch da trat, die harte Lage zu mildern . . . der schönste Zug des chilenischen Volkes, die unbegrenzte Gastfreundschaft, in ihre vollen Rechte.’

One learns that these German settlers took for their device—‘Kannst du den Völkern nicht die Tyrannen nehmen, so nimm den Tyrannen die Völker,’ thus suggesting a parallel with the Pilgrim Fathers of the northern continent.

This chapter cannot be closed without a passing reference to Antoine de Tounens, a French adventurer, who in 1861 proclaimed himself Orelie Antoine I, King of Araucania, the French, of course, being invited to assist him by their subscriptions to maintain their national credit. He was soon caught by the Chileans, who showed their good sense by refusing to give him the advertisement of martyrdom. They sent him back to France—as a madman.

IV

IMPRESSIONS OF CHILE

CHILE is so varied in physical features that even the most self-confident of globe-trotters would search in vain for a general formula to apply to the whole country. Journeying from north to south, the traveller passes in turn through regions given over to mining, to agriculture, to viticulture, to forestry, and to sheep-farming; from the arid desert of Tarapacá to the storm-beaten cliffs of Magallanes—the annual rainfall, non-existent at first, rising with every few degrees of latitude. In the changing scene that which is constant most impresses him—the mountains on his left, the sea on his right, and the character of the man who dwells between them.

If the first view of Chile is obtained at Iquique, the following passage may be read with interest; it was written seventy-five years ago:—

‘The whole is utterly desert. A light shower of rain falls only once in very many years; and the ravines consequently are filled with detritus and the mountain sides covered by piles of fine white sand even to a height of a thousand feet. During this season of the year a heavy bank of clouds, stretched

over the ocean, seldom rises above the wall of rocks on the coast. The aspect of the place was most gloomy : the little port, with its few vessels and small group of wretched houses, seemed overwhelmed and out of all proportion to the rest of the scene. The inhabitants live like persons on board a ship ; every necessary comes from a distance ; water is brought in boats from Pisagua, about forty miles northward, and is sold at the rate of nine reals ($4\frac{2}{3}$) an eighteen gallon cask. I bought a wine bottle full for three-pence. In like manner firewood and, of course, every article of food is imported. Very few animals can be maintained in such a place.' ¹

What Darwin says here of the natural conditions of Iquique applies with little alteration to the whole of the nitrate coast. This is a land of business, not of pleasure ; it is said that the Incas knew the fertilizing value of the nitrate deposits, just as they knew that of guano, but, scientific agriculturists though they were, the knowledge was not utilized, and this forbidding country was left to later treasure-seekers. To-day the high plateau bordering on the coast is seamed with the short railways that convey the nitrate to the ports, and which take up in turn the manifold requisites of a modern factory. Since coal, food, water, forage—everything—has to be imported, the upgoing trains are as full as those which descend.

The nitrate is found close to the surface in marble-

¹ July 12, 1835 : Darwin's *Journal of Researches*.

like deposits, to the various layers of which special names are given. Those engaged in extracting it begin by boring a shaft through the hard bed to the gravel below ; in this, through the agency of a small boy, a cavity is scooped out ; a dynamite cartridge is inserted and fired : and then the fragments thrown up by the explosion are removed to the factory. Here, after being crushed by machinery, they are placed in tanks through which boiling water is passed ; when hot the water takes up more of the nitrate salt than it can hold in solution when cool ; the salt is therefore precipitated during the cooling process into pans, from which it is collected. Of course, the procedure is more complicated than is here represented ; the rough blocks have to be treated in a variety of ways before they yield the pure crystals which are eventually sent down to the coast in bags, each containing two hundred pounds. Thus little settlements are to be found at intervals in the four hundred miles of desert plateau which runs parallel to the sea at a height of three to five thousand feet. Darwin, we may be sure, would recognize the district at a glance, but he would have to re-write his description of Iquique. It is now a city of large open squares and broad streets intersecting on the North American system ; it possesses tramways, electric lighting, clubs, newspapers, and substantial buildings ;

above all, a constant water-supply is now brought through pipes from Pica.

But in spite of this evidence of prosperity it is not without a feeling of relief that the traveller takes ship and leaves the rainless coast ; the eye wearies of its dull, monotonous colouring as it wearies of a snowfield ; it longs for some more restful hue, and should Valparaiso be the next port of call, one is little inclined to question the appropriateness of the name. At one time, indeed, the surrounding hills were covered with trees, as is still the case with the hills of the south, and then the contrast to the nitrate coast must have been even more apparent and welcome. To-day the forest has disappeared, but there are abundant signs that the traveller has reached a land ' where there is no want of anything that is in the earth '.

The harbour of Valparaiso is a semicircular bay facing the north ; it is surrounded by hills upon the sides of which the houses balance themselves—leaning on one another's shoulders, as it seems, in order to keep in touch with the shipping upon which prosperity depends. It is this pressing to the sea which characterizes the city. The people, and the buildings, the land itself, all seem animated by the same tendency. The hills, forced outwards by the mountains behind, push out into the water and leave

but a narrow strip of flat foreshore along the quays. Here are found the two chief streets of the town, the others arrange themselves along the hill-sides or run inland when the slope is less severe: space is valuable, and the houses rise one above the other to an undesirable height—undesirable because Valparaiso is situated in an earthquake zone. It is this peculiar and inevitable disposition of the buildings which accounts for much of the damage caused by the earthquake of 1906. This terrible disaster brought out the fine qualities in the Chilean character; aid was immediately rendered and the port is now once again flourishing. Destruction on this wholesale scale was perhaps less overwhelming to Valparaiso than to a town less familiar with calamity; fate has dealt it many grievous blows in the past, and from each it has risen to increased prosperity. When Francis Drake took it in 1579 it contained but a dozen houses, a church, and a couple of shops; in 1594 it was sacked by Richard Hawkins, whose act was imitated a few years later by the Dutchman, Van Noort; an even more serious injury was dealt by the hand of Spain when she bombarded it in 1866 and did damage to the extent of twelve million dollars. After the defeat of Balmaceda it was plundered by the Chileans themselves. The crowning visitation of 1906 was but the

latest of a series of earthquakes : its toll is estimated at ninety per cent. of the houses. Mr. Perez Canto's comment is an epitome of the intrepidity of this phoenix city : ' The new Valparaiso will be better planned in every respect.'

If—as is usually the case—the traveller approaches Santiago from Valparaiso, he will be impressed at once with the contrast in the disposition of the streets, in the architecture of the houses, and in the general character of the city. The difference is easily explicable : the design of Valparaiso was forced upon those who built it ; that of Santiago was deliberately selected. In Valparaiso all else had to be subordinated to the needs of the port, in Santiago man has moulded natural features to his will—for instance, the rocky fastness of Santa Lucía has been converted into a pleasure-ground ; where a foreigner would call Valparaiso ' busy ' he would describe Santiago as ' elegant '—and this in spite of its possession of the substantial buildings to be expected in a seat of government which is also a commercial centre ; to the ear the former is German ; to the eye the latter is a town of Old Spain. In the capital of Chile space seems of little account : the houses are built upon a generous plan which ignores the price of land ; but the stranger who goes to bed censuring this apparent wastefulness may have

the justification intimated to him in his sleep. He may find himself dreaming of tube railways, and of the inconvenience caused to neighbouring householders by the noisy trains. In the morning he will learn that there had been in the night a slight earthquake accompanied as usual by a dull rumbling sound. And now he knows why so many of the houses in Santiago are but one story high; the architect of their height and form is the earthquake. They are built round a central uncovered courtyard to which all the rooms have separate access, and in this open space the inhabitants take refuge at the first menace of danger.

The outer windows are barred, but through the formidable gateway may sometimes be caught pleasant glimpses of green shrubs and cool water, which suggest that if many of its buildings are low and unimposing, Santiago has leanings towards the ornamental side of life. This impression is confirmed by the gay colours of the stucco enrichments which meet the eye on all sides, and by the evident appreciation with which the people resort to their exquisite Alameda, and to the other pleasure resorts upon which the town prides itself. The best known of these is the hill of Santa Lucía, which towers so masterfully above the houses below that the sight of its grottoes, kiosks, and statues comes as some-

thing of a shock : it recalls Hercules tricked out by Omphale. The hill has known other days : it was here that Valdivia and his handful of Spaniards stood at bay like the builders of the Temple :—

‘They which builded on the wall and they that bare burdens, every one with one of his hands wrought in the work and with the other hand held a weapon.’

To-day Santa Lucía rises peacefully against her mountain background to bear witness that neither Indian nor starvation could prevail against Valdivia.

As the traveller proceeds southwards he finds that the central or agricultural district is being swallowed up in the forests. It is not easy to say where the former should be deemed to end ; at present the boundary may be taken to be the Bio-Bio river, but there is a strong disposition to clear away the trees and establish arable and pastoral industries where they once grew thickly ; in the present condition of the lumber market there is little inducement to conserve timber, and there is reason to suppose that this policy will be continued. It is not unattended with risk, for with the disappearance of the trees the rainfall may be affected. However, it is not the whole of the forest country which it would pay to clear ; large tracts are hardly more than bogs, from which no return could be expected. Indeed, so

impassable are they that two of the first German colonists were engulfed and killed. The famous Lota Company has interested itself in afforestation and plants many trees annually in the neighbourhood. Lota is practically the creation of the Cousiño family and possesses a history in which Chileans may take pride. About the middle of the last century energetic steps were taken to develop the coal-field which had been known to exist there for some time ; and now the wealth obtained from the mine has enabled the proprietors to lay out the famous park of Lota, and to carry on their business not only on practical but also on philanthropic lines. This is the more creditable to their energy since the coal extracted, being of comparatively poor quality, was not able to compete on the nitrate fields with that brought from England. The cost of haulage was such that it paid the companies to buy the best fuel ; and this they obtained comparatively cheap because the steamers which brought it were sure of a nitrate cargo for the return voyage. The proprietors met the situation by establishing at Lota a drain-pipe factory, a brick-field, glass-works, and a copper foundry. Further south yet another instance is to be found of Chilean pertinacity. One would have thought that the incessant rain and bitter winds of Magallanes would have repelled the hardest pioneer.

Nevertheless, it has been discovered that it pays to keep grazing stations there, since sheep, forced either to grow thick fleeces or to die of cold, tend to the former alternative. The former convict station of Punta Arenas has thriven on the new industry. The nation which has established prosperous towns on the nitrate desert and in the Straits of Magallanes can face the future with confidence.

V

NATIONAL FINANCE

THE following information, embodied in the last Presidential message to Congress with regard to finance and other subjects upon which Mr. Perez Canto has not touched, seems an indispensable addition to the introduction section.

The ordinary national revenue of Chile in 1910 was \$152,975,645 in notes (*pesos* of approximately 11*d.*) and \$82,764,423 in gold (*pesos* of 1/6). If to the note revenue be added \$39,333,216, the proceeds of the sale of \$23,238,519 of the gold, the revenue will stand at \$192,308,861 notes and \$59,525,904 gold, the equivalent, together, of £13,278,598. (To this total the Customs House contributed—as import duties, £3,526,117; as export duties on nitrate and iodine, £6,029,533; as warehousing, lighthouse and buoys dues, £68,005; and as wharfage, unloading and transit dues, £73,913; whence it will appear that the national income is principally derived from the Customs House.) The ordinary and extraordinary expenditure amounted to \$234,143,253 in notes

and \$60,677,704 in gold, leaving a deficit of \$41,834,392 in notes and \$1,151,800 in gold, which was incurred mainly through expenditure on railways and public works in general. Adding to this the figures corresponding to 1909 there results a deficit at the end of 1910 of \$77,616,504 in notes and a surplus of \$7,853,344 in gold, and if the latter be converted into paper money it reduces the net deficit to \$64,658,487, or £2,963,513.

The following figures, however, will show that in reality this 'deficit' represents an investment of capital perfectly justifiable in a new country if it wishes to develop its sources of production :—

The so-called 'deficit' amounted in the years 1909 and 1910 to \$64,658,487 paper currency.

A close examination of the budget of those two years shows that the following amounts were 'invested' in the construction or equipment of railways or public works and buildings. These may be looked upon as reproductive works, as the former is an industrial enterprise and the latter are represented by water-supply works on a paying basis, and by buildings for public services which, before their construction, paid rent on premises let at high rents.

1909

PAPER CURRENCY

Construction of railways, equipment or same, and buildings. Industry and Public Works Department . . .	\$20,385,000.00
Public Works and Buildings. Home Department	3,355,000.00
Public Buildings. Justice Department	995,000.00
Public Buildings. Public Instruction Department	2,447,840.00
Public Works. Finance Department	3,600,071.21
Public Buildings. War Department	1,298,000.00
Public Works. Navy Department	1,283,000.00
	<u>\$33,363,911.21</u>

GOLD

Public Works. Navy Department	\$2,643,333.33
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Adding to this amount of \$2,643,333.33 the premium of 65 per cent. for gold it is equivalent in paper currency to \$4,361,499.99.

Therefore the 'investments' which appear in the 1909 budget as 'expenses' amount to \$37,725,411.20.

1910

PAPER CURRENCY

Construction of railways. Industry and Public Works Department	\$17,540,000.00
Public Buildings. Home Department	1,626,000.00
Public Buildings. Justice Department	934,000.00
Public Buildings. Public Instruction Department	2,125,968.46
Public Works. Finance Department	2,379,600.00
Public Buildings. War Department	1,010,000.00
Public Works. Navy Department	1,382,000.00
	<u>\$26,997,568.46</u>

GOLD

Purchase of Locomotives	\$1,000,000.00
Public Works. Navy Department	1,380,000.00
	<u>\$2,380,000.00</u>

At the average premium for gold of 65 per cent. this last sum amounts to \$3,927,000.00 in paper currency, thus making the 'investments' of this year amount to \$30,924,568.46.

But in addition to this there is also a sum of \$6,000,000 gold which cannot be considered as an expenditure, since it was the amount which was deposited in cash in European banks to increase what Chile calls her conversion fund, and which amounted on December 31, 1910, to £7,075,429 12s.

The sum of \$6,000,000 gold which appears to the 'debit' of the 1910 financial exercise has therefore not been 'spent'. It lies in the vaults of European banks, and in order to show Chilean finances in their true light it is necessary to add this amount of \$6,000,000 gold, *plus* the gold premium of 65 per cent., or in all \$9,900,000, to the sum of \$30,924,568.46 'invested', thus forming a total amount of \$40,824,568.40, which covers approximately the so-called 'deficit' of the 1910 financial exercise.

If we add the 'investments' of 1909, viz. \$37,725,411.20, to the 'investments' of 1910, which amount to \$40,824,568.40, we arrive at the figure of \$78,549,979.60, which covers, leaving a surplus, the so-called 'deficit' of \$64,658,487.

The Chilean Government, therefore, cannot justly be charged with allowing deficits in its budget, though

it must be admitted that the peculiar method of presenting the national accounts is misleading ; but the Government is decidedly at fault in having attempted to undertake with the 'ordinary' resources of the country public works of considerable importance which should have been provided for with 'extraordinary' resources.

The ordinary and extraordinary revenue for the present year (1911) was estimated at \$82,600,000 in gold and \$175,700,000 in notes, or together, £14,247,916, and the net expenditure at \$42,500,000 in gold and \$238,900,000 in notes, the equivalent of £14,137,083, which leaves an estimated surplus of £110,833. It is believed that when to this is added the saving on the estimated expenditure it will be sufficient to meet the obligations created by the special laws promulgated up to the present time, after eliminating the one issued in March last with reference to railways.

During 1910 the External Debt increased by £2,600,000, of which £1,500,000 was earmarked for the construction of the Arica-La Paz Railway and £1,100,000 for reconstruction work in the city of Valparaiso. Ordinary amortization reduced the debt by £380,700, and on December 31, 1910, the balance amounted to £25,258,620. (At the beginning of the present year the Government entered into

a contract with Messrs. N. M. Rothschild & Sons to take up one-half of the unissued loans sanctioned up to that date by special Laws, the transaction being completed for £4,905,000.) The Internal Debt, on December 31, 1910, stood at \$6,093,800 gold and \$179,465,191 notes, or approximately £8,682,523.

The total public debt of Chile is, therefore, at present as follows :—

External Debt	.	.	.	£30,438,620
Internal Debt	.	.	.	8,682,523
				<u>£39,121,143</u>

According to moderate estimates the value of the Chilean State railways can be reckoned at from £15,000,000 to £20,000,000. The 'conversion fund' amounts to £7,075,429 12s. deposited in European banks and \$32,954,400 in mortgage bonds (Bonos de la Caja de Credito Hipotecario).

Besides this the Chilean Government holds another \$22,043,700 in these same mortgage bonds, which makes the total amount of this item \$59,998,100 or approximately in pounds sterling £2,500,000.

The Chilean Government owns nitrate properties worth several millions of pounds, and an enormous extent of agricultural and forest lands in the south, which by themselves would cover several times the total amount of the public debt.

From this it is evident that Chile's means of paying her debt are not only the ordinary means of taxation to which every country can resort, but also industrial, mineral and land properties, and actual cash in hand which at any moment she can dispose of for this purpose.

To supplement Mr. Perez Canto's chapter on the population it may be mentioned that during 1910 the Civil Register recorded 129,999 births, 103,399 deaths, and 19,352 marriages.

Chile's progress in educational matters deserves recognition. At the end of 1910 there were, according to the Presidential message, 2,716 State primary schools, with 4,829 teachers, or 334 schools and 371 teachers more than in 1909. Of the teaching staff about a quarter had been trained in the normal schools, of which there are 15, attended by 2,222 pupils of both sexes. The number of pupils in the Government schools was 258,875, an increase of 32,613 on the 1909 figures, and the proportion of attendance was 57 per cent. This is recognized as unsatisfactory, and steps are being taken to improve it. During 1910, 2 normal schools, 43 primary schools, and 9 buildings intended for secondary and superior education were completed, and recently the Ministry for Instruction sanctioned the erection of a further 43 educational buildings.

The State subsidizes private schools to the extent of £120,000 annually, and these, in 1910, were attended by 36,577 pupils. In schools not State-assisted the pupils numbered 30,385. The Government believes firmly in the value of technical schools, of which at present there are 228, and proposes to double the grant in aid of these institutions in the coming year.

In Chile, during 1910, 74 male and female colleges were opened, and were attended by 18,669 pupils. The Government assists 19 institutions providing secondary instruction for men and 47 for the education of women. To the excellent University of Chile various professional schools are attached, and the attendance at these of male pupils during 1910 was 1,805. Finally, 2,296 pupils, or 195 more than in 1909, attended Chilean commercial institutions.

During the year under review much was done in the direction of public works. A drinking-water supply service will very shortly be completed in the cities of San Felipe, Los Andes, Casablanca, Cauquenes, Quirihue, Colquechura, Chillán, Yungai, Concepción, Talcahuano, Angol, Temuco, Victoria, Nacimiento and Osorno, and the same may be said of the drainage works in Antofagasta, Serena, Taltal, Curicó, Chillán, Talca and Concepción. The sewerage works at Santiago, completed towards the end of

1909, are in satisfactory working order, and the draining and paving works already carried out in Valparaiso, together with the construction and repair of public buildings, parks and squares, has greatly contributed to the sanitation and embellishment of the chief port of Chile.

The committee appointed to study the improvement of Chilean harbours having reported, tenders for the extensions at Valparaiso and San Antonio were invited in Washington and New York and in eight European capitals, and the end of this year should see the beginning of the works proposed. As to the construction of the new graving-dock at Talcahuano, the tender of a French syndicate for the sum of £948,525 was accepted and work is already in progress. It should be completed within four years.

Mr. Perez Canto in his chapter on Means of Communication gives an account of the activity in railway construction. The question of the advisability of electrification is under discussion, and it is quite possible that, following the lead of the Brighton Railway, the Chilean Government may substitute electric traction for steam on the Santiago and Valparaiso Railway. According to Mr. Philip Dawson, the consulting electrical engineer of the Brighton Railway, it is quite feasible to electrify that famous

railway to Brighton, and this may be done in the interest of economy and of a more efficient service. The high price of coal in Chile is an additional reason for the change in that country from steam to electricity.

In military and naval matters there was considerable activity. New artillery supplies were contracted for with the firm of Krupp, and aviation was definitely introduced into the army service, officers and mechanics being selected to study the science in Europe. The construction of two battleships of the Dreadnought type, six destroyers and two submarines has been contracted for, and the Government is studying the question of coast-fortifications and naval arsenals. Another matter which is occupying the attention of the Government is the establishment of wireless telegraphy stations at Punta Arenas, Talcahuano, Caldera, Antofagasta, and Arica. At the time of writing the only station in operation is the one at the fort at Talcahuano, in Valparaiso, which places the city in communication with the men-of-war and merchant vessels passing the coast.

As to land communications, the laying down of the new cable in the Cordillera in the section between Peñon and Juncal was successfully accomplished, and further extensions are in progress.

VI

THE FUTURE OF CHILE

ENOUGH has been said to show that Chile has little cause to view the coming years with apprehension. There are a few clouds on the horizon, but compared to that of many other nations the Chilean outlook is a matter for congratulation. Reference has already been made to the disappearance of timber in the central districts—a disappearance due in part to the unthrifty methods of the people. But danger from this source can be met by a policy of afforestation. On the other hand, the profits derived from the nitrate deposits are paid, as they are in British coal mines, out of capital; the beds will not be relaid in our epoch. Chilean Government experts have calculated that if the consumption of nitrate in the world continues in future years to develop on the same scale as it has done during the last 25 years, the explored nitrate fields show that there is sufficient nitrate for another 150 years. Besides this, there are a great many fields which have not yet been explored. At present the Government derives a third of its revenues from nitrate, and it

could not but be embarrassed if it were to lose such a proportion of its income. But this problem does not demand immediate solution. More serious than a future shortage of timber or of nitrate is the present shortage of Chileans. There are but a little over three millions of them—a number insufficient to develop the resources of the country or to defend without ruinous effort so long a seaboard against a powerful foe. And this brings us to the discussion of armaments. One view of the question was put forward with much lucidity by Señor Agustín de las Manos Albas in the South American Supplement issued by *The Times* on July 25, 1911.

He regards 'the importation of the problem of armaments into the international life of South America as an unhealthy sign' copied without discrimination from Europe together with the other paraphernalia of civilization.

'The conditions of the South American countries, however, do not call for any such manifestation of national life; no reasonable dispute can exist as to territory where the land lies waste and desert for thousands and thousands of miles, and where the whole population of the continent could be housed comfortably in any single one of the larger nations; hatred of race or international rivalry do not exist, and the conflict of vital interests is unknown. . . . Budding prosperity begins, however, to be taxed

to the utmost for the creation of military establishments which, from their very essence, are bound to impose greater sacrifices each day. Brazil, Argentina and Chile lead the way ; immense sums from their national treasuries are being spent in the purchase and maintenance of Dreadnoughts, entailing the creation of problems to justify them. . . .'

These are weighty words, but it cannot be affirmed that South America is heedless of the danger to which they refer : her zeal in the cause of arbitration has been a satisfactory omen for the future in a period when the Great Powers have set no very edifying example. At the same time, when the South American statesmen read the strictures made by the newspapers of the great nations upon each other's actions, they may be pardoned for considering armaments vital to their safety. These they desire to owe to their own strength. The Monroe doctrine implies a moral subordination to the United States which is repulsive to the national feelings of the young republics ; it is felt that to invoke it in a moment of danger would be to surrender many material interests to the protecting power. Moreover, one cannot assume that the South American nations will not go to war with one another merely because such a course is financially undesirable. Pecuniary considerations are apt to be forgotten in

hot-blooded young countries when party feeling has been aroused. Chile, as we know, came very close to war not long ago with Argentina over the watershed controversy, and she has still upon her hands a perplexing dispute with Perú.

In the treaty which marked the termination of the Nitrate War it was agreed among other things that Chile should enter into occupation of the provinces of Tacna and Arica ; these provinces are now practically Chilean, and the question of ownership is not likely to be seriously raised by Perú, though we occasionally hear that Perú is anxious that the plebiscite shall be held. Any such pretension is regarded by Chile as incompatible with her sovereignty : furthermore, she affirms that the proviso about retrocession was only inserted to enable the Peruvian negotiators to pacify their own countrymen, and that this was understood by the responsible parties on both sides. Be that as it may, Chile asserts that these provinces were as much the prize of war as Tarapacá ; and so firmly resolved is she not to give them up that she declines to submit the dispute to arbitration. Here then may be found the possibility of trouble. Fortunately for Chile she would enter into a struggle with Perú with excellent prospects of victory ; indeed, one cannot help thinking that a moment when magnanimity could not be construed

as weakness might be seized by her to cement a friendship with her northern neighbour. The Peruvians must recognize the difficulty of withdrawing from 'occupied' territory—it is a difficulty which is proverbial—and no doubt they would renounce their claims to the provinces in dispute for no large sum: they are concerned rather for their national honour than for any material advantage, and a settlement might be reached if Chile offered a price at which the removal of anxiety would be cheap.

The other neighbours of Chile are Bolivia and Argentina. No danger is at present to be apprehended from the former, who is inclined to seek Chilean assistance in utilizing her undeveloped resources. As for Argentina, she and Chile have faced one another with their knives out long enough to recognize what a protracted and profitless business a war between them would be. Moreover, they will have difficulty in striking one another's vitals; the Andes and Cape Horn are cogent peacemakers.

But in former times the Andes acted as a barrier against the merchant as well as against the invader; Chile and Argentina were allowed little opportunity of discovering and developing their common interests. This is no longer the case. Since the completion of

the Transandine tunnel it is possible to travel by railway by way of Mendoza the whole distance between Buenos Aires and Valparaiso. This is but one of many new lines projected by the Chileans, who, from the time of Ambrose O'Higgins, have recognized that nothing contributes to wealth and progress so much as improvement in communications. The Transandine railway is universally regarded not only as a convenience but as an instrument which must make for a better understanding between the countries it connects. As the Argentinos and Chileans come to have interests in common they will find themselves dependent on one another; their relations will grow more complex, and the dislocation that war would bring with it will be viewed with dismay; there are obvious disadvantages in shooting the man who buys one's cattle and sells one his coal.

That the Transandine railway has answered expectations may be inferred from the activity in the Chilean railway world; it might have been supposed that its leading spirits would have rested content with the substitution of an unbroken train-journey of some thirty-six hours for the cold voyage by steamer with its fortnight of rough weather. But this is not so. The Buenos Aires Great Southern Railway Company are credited with the intention of pushing the Neuquen line across the mountains

into Chile, presumably with an eye to Talcahuano as the western terminus. It would not have been surprising that such a project should have been entertained while the Andes were still untunnelled, for the passes near the Bio-Bio are lower and present fewer difficulties to the engineer than is the case in the latitude of Mendoza ; but that it should meet with favourable consideration now that a competing line is in operation is both surprising and gratifying ; it can only mean that practical men have made up their minds about ' The Future of Chile '.

The district that would thus be put in direct communication with the east is already the seat of a thriving trade. It comprises the Arauco coal-field together with the factories of Lota--about which something was said in a previous chapter ; Talcahuano, the finest harbour on the coast, and the one which the Government have made the head-quarters of the Chilean navy ; and the corn-growing district of which Concepción is the distributing centre. As the population of North America becomes denser less wheat will be available for export, and an era of great prosperity is then anticipated for Chile, whose cereal products already enjoy a high reputation. Any such development could not but stimulate trade in the region traversed by the proposed line. Chile has never shrunk from railway enterprise ; handi-

capped by the engineering difficulties which her territory presents, she has obtained less assistance than the other Latin republics from foreign financiers. She herself has had to find much of the money which her railways have demanded—this being the explanation of the large extent of line belonging to the State. On the plains of the east the construction of a permanent way meant little more than the laying down of sleepers ; in Chile even the ‘longitudinal’ railway was expensive to build ; it had to traverse not only the spurs of the mountain system but also the innumerable streams that rushed from the heights to the sea.

With such a country for his sphere the railway engineer of Chile has come to ask himself, not ‘Is this difficult?’ but ‘Is this practicable?’ and his answer has usually been in the affirmative. For instance, he has not rested content with the railway from Antofagasta to La Paz by way of Oruro, but he hopes to complete another line to La Paz next year from the port of Arica. The capital of Bolivia will thus be brought within twelve hours of the Pacific.

The map reveals the secret of this solicitude about Bolivia ; that country marches with Perú, Brazil, Paraguay, and Argentina, as well as with Chile, and it is the inevitable international competition for the

trade of a country with no seaport of its own which has constrained the far-sighted Chilean to these exertions.

And this brings us to the subject which is the pre-occupation of all who use the western coast : What changes will be brought about by the greatest improvement in natural communication that the world has yet ventured upon ? How will Chile be affected by the opening of the Panamá canal ? The answer may be deduced from the fact that, to shipping, the Pacific ports of South America will be brought—on an average—four thousand five hundred miles nearer to Liverpool, and that the saving in the case of New York will be twice that amount. Chile, in fact, stands to gain from the canal in many ways more than any other South American State. Henceforward her great reproach will be wiped out ; she will no longer be the distant country at the back of the west wind. The energy she has displayed in binding Bolivia to herself with ropes of railway steel is now easily intelligible. At present, perhaps, there is no great advantage in building a second expensive mountain railway to connect an undeveloped country with the coast ; but Bolivia's development has yet to come ; her mineral wealth is well known ; she too will follow the example of her neighbours and utilize her resources ; and then the port of Arica will offer importers' steamers the inducement

of a cargo home. When this happens it may be anticipated that freights will be reduced, not only in proportion to the miles and the days saved by the canal, but also in proportion to the increased probability that the shipowner may obtain further business. This should mean a notable decrease in the price at which imports can be sold in Chile—with a consequent cheapening in the cost of production which should enable the exporter of Chilean commodities to enter markets hitherto closed. What is said of the trade of Arica, of course, applies—*mutatis mutandis*—to the whole trade of Chile. And the new conditions should do much to solve the immigration problem.

But the future of Chile does not rest merely upon the material advantages which have been enumerated ; it is securely based upon the intense patriotism of the inhabitants and upon the sacrifices they can be relied upon to make for their independence. Liberty, says Wordsworth, rejoices in two voices as her chosen music:

‘ Two voices are there ; one is of the sea,
One of the mountains ; each a mighty voice.’

The Chilean has listened to both of them from his cradle.

R. P. P.

108 BANBURY ROAD, OXFORD,
October 13, 1911.

CHILE
AN ACCOUNT OF
ITS WEALTH AND PROGRESS

BY
JULIO PEREZ CANTO

CHAPTER I

THE PROGRESS OF CHILE

To appreciate the true importance of a people from the economic point of view it is necessary to study not only the conjunction of the elements which combine to produce its wealth, but also the social facts that exercise a more or less direct influence upon its well-being and upon its material prosperity. If we say, for instance, that the Republic of Chile has an area of 292,100 square miles, that its population is composed of 3,249,000 inhabitants, that its territory extends to the foot of the Andean range, and that its coast is washed by the waves of the Pacific Ocean for thirty-eight geographical degrees of longitude ; if we add that by reason of its peculiar situation and the long southerly reach of its domains it exhibits the most varied physical and climatological characteristics, we shall merely have given an idea, superficial though suggestive, of the natural conditions by which the country is favoured.

If, however, we point out that its population is equally distributed between the land and the cities ; that its agriculture amply provides for the necessities

of its inhabitants and still leaves an appreciable surplus for exportation ; that its mineral wealth surpasses that of any other country in South America, and that its economic activity is represented by an exterior commerce amounting to £46,972,500, we shall have broadened considerably the horizon of our ideas as to Chile.

Yet neither the area of its territory and its natural conditions, nor the number of its inhabitants and their industries, are wholly satisfactory elements by which to judge the country, either as a nation or as an economic entity. To appreciate its importance from the sociological point of view it would be necessary to inquire into the origin of this people, to study the formation of its nationality and the characteristics peculiar to the race ; it would be equally necessary to follow the development of its economical and social advance, and to observe how the course of time has shaped its institutions. Only thus may we appraise its worth as a State, the value of its productive powers, and its capacity for the reception from the outside world of impulses in the form of labour and capital, elements so necessary to the sparsely populated and almost virgin countries of America.

The nature of this book will not permit of our devoting much space to the study of Chilean history and institutions, which will not interest us except

in so far as they help to explain the economic evolution of the country. We propose, rather, to treat of the results of private and State initiative in the development of its industries and its commerce, of the sources of its wealth and of the elements which it possesses as a workaday and progressive nation.

The road along which this country has travelled in its first century of independent life is marked by events which have made epochs, such as the promulgation of the Political Constitution of 1833—to this day the Magna Charta of the people—the reform of the Colonial-Spanish legislation, the diffusion of free public education, the construction of the first railroad in South America, the introduction of steam navigation, of the telegraph, of lighting-gas, of urban tramways and of many other advantages of civilization. In virtue of its progress and by favour of the attributes of the race and the foresight of its rulers, Chile stands now at the head of the Latin-American peoples. Chile, which was the poorest of the Spanish colonies, which boasts neither the area nor the population of other American countries and which lies most distant of all from the great centres of civilization, has nevertheless succeeded in reaching one of the foremost positions among the nations of the New World, and this with but little of the powerful assistance which the currents

of foreign immigration have afforded to some of its neighbours.

Upon its completion of a century of independent existence Chile has been able worthily to celebrate the glorious date of its political emancipation, and the manner in which the great European nations have shared in the public rejoicing affords eloquent testimony of the cordiality of the relations that it cultivates with all civilized peoples, as also of their appreciation of its wise organization, of the order and peace in which its institutions are developed, and of the guarantees enjoyed on Chilean soil by all legitimate interests. The foreign embassies and missions sent to celebrate the centenary of Chile's independence were able to appreciate the active commercial movement which, quickened by the brains and the capital of foreign residents of all nationalities, pulses through the whole country. Particularly could they note the utilization of the manifold natural resources of the territory, the development of mining, agricultural and industrial affairs, and the increase of international commerce.

The fertility of the soil, the beneficence of the climate, the abundance of water for land-irrigation, and the inexhaustible mineral wealth of the mountains ensure for Chile a brilliant future if it can count upon the elements necessary for the development of its production. Like all the other South American

countries Chile needs the co-operation of foreign brains, labour and capital to give its existing industries a wider scope, to open new fields of activity, to populate the uninhabited regions, to perfect the means of transport, and to facilitate relations with the nations which offer a market to its products.

With this purpose in view we have written this book, judging impartially and relying upon official information and trustworthy private data. It will serve as a safe guide not only to the tourist, but also to all who would make the acquaintance of what is one of the best organized countries of Latin America and, without doubt, that which is blessed with the greatest diversity of products, the finest climate and the most picturesque scenery.

CHAPTER II

PHYSICAL CHARACTERISTICS

THE Republic of Chile occupies that southern portion of South America which, closely following the meridian, extends from the river Sama to Cape Horn within the parallels $17^{\circ} 15'$ and $55^{\circ} 59'$ of latitude south. It thus forms a long littoral zone, stretched like a ribbon between the Andes and the Pacific and covering a longitude of thirty-eight geographical degrees. To the north the rivers Sama and Mauri separate it from Perú, to the east it is bounded by the Republics of Bolivia and Argentina, and to the south and west the Great Ocean bathes its coasts.

The most recent calculations assign to Chile an area of 292,100 square miles, the equivalent of the combined areas of Germany, Switzerland, Denmark, Holland, and Belgium. The length of the territory is 2,627 miles, and its breadth varies between a *maximum* of 248 and a *minimum* of 105 miles.

In addition to its island region south of the 41st parallel Chile possesses numerous islands in the Pacific, some of them of a certain productive importance, such as Juan Fernandez and Easter Island, which lie far from the coast.

The topography of the country exhibits a very unusual relief which allows of its classification in zones of highly diverse orographic and hydrographic characteristics. To the east rises the Andean range with its innumerable ramifications and its towering snow-capped peaks ; to the west the somewhat lower range springs almost from the shores, gashed at intervals by deep ravines and penetrated here and there by rivers ; between the two chains lies the central or longitudinal valley, extending almost without interruption for more than nine degrees, from the slopes of Chacabuco to the crater of Reloncaví.

Of the two mountain ranges which run parallel from north to south the Andean chain is the more notable by reason of its extreme altitudes, its sharp slopes and the regularity of its incatenation. In some parts are found passes or gaps which facilitate communication with Argentina.

The Chilean Andes spring from the great table-land of Bolivia, which is formed by two branches, the western branch constituting the frontier between the two republics. In the prolongation of this chain rise at intervals lofty snow-capped peaks such as Tacora, 19,521 feet in height, whose sulphur-pits are industrially exploited. On the whole, however, the chain preserves for a long distance the aspect of a hill-range whose slopes fade gradually into the high region known as the Puna de Atacama. Further

south it takes the form of a chain of mountains of considerable height, prolonged in diminishing elevation as far as Cape Horn, the last manifestation of the range in the southern extremity of the continent.

Regarded as a whole, the base which supports the lofty masses of the Andes exhibits from north to south a very notable inclination. In the northern region and in the Atacama desert its average height is approximately 13,120 feet ; between the twenty-sixth and twenty-eighth parallels it reaches an altitude which may be estimated at 16,350 feet. South of this it sinks a little, but rises to over 16,400 feet, its greatest average height, between the thirty-second and thirty-fourth parallels, in which region are found some of the highest peaks of the continent : Aconcagua, on the Argentine frontier, and, among others, Mercedario, Juncal, Tupungato, and the San José volcano, near Santiago. Thence to the south there is a much more appreciable and rapid diminution in its height down to the Straits of Magallanes, where it reaches to only some 700 or 800 feet above sea-level.

In its long course the range splits into two parallel branches which as a rule do not travel far from the water-shed and whose heights are not materially reduced. Frequently it happens that the highest summits of the Andean system are found in these secondary branches.

In these ramifications of the Cordillera lie valleys, very appropriately called *cajones* or 'boxes', closed in by high scarped cliffs which drop from the zone where no vegetation will grow, a region situated at a higher or lower altitude according to the latitude and the meteorological conditions of the district.

The line of perpetual snow also varies according to the same conditions, but as a rule it lies between 11,800 and 13,200 feet in the central region of the country. South of the thirty-second parallel the first glaciers are met with in the heights which run from west to east, and from the forty-sixth parallel glaciers extend almost down to the shores.

Throughout its course the Cordillera exhibits in its transverse profile considerable inequality of gradient : while on its eastern side its slopes are smooth and gentle and the spurs which branch from its summits lose themselves gradually in the broad plains or pampas of Argentina, on its western side, overlooking Chile, the descent is rapid and precipitous and the mountain streams fall from a height of 10,000 feet without travelling more than 6,000 feet westward from their source. The rivers are torrents ; cascades and waterfalls abound, and the ruggedness of nature contributes to the grandeur of the splendid scenery of the Chilean Andes.

At the foot of the great Cordillera spreads the central or longitudinal valley, which extends un-

broken from the thirty-third parallel to beyond the forty-first. Traces of the existence of this notable phase of the territory begin to be apparent in the vicinity of Tarapacá and in the Atacama desert. The valleys of Chañarcillo and Huasco, and various plains, accentuate the territorial depression further south; between the rivers Coquimbo and Choapa valleys disappear, to begin again before the Chacabuco branch is reached. From this point to the crater of Reloncaví the central valley travels for upwards of six hundred miles with a breadth which varies from 7 to 56 miles. In form it is very irregular, and is interrupted in some parts by ramifications of the Andean chain or the coast range. The most interesting characteristic to be noted in this part of the territory is the grand slope of its transverse profile, which has permitted the development on a large scale of land-irrigation by means of artificial canals. For instance, the height above sea-level of Santiago, a city situated at the foot of the Andes, is 1,820 feet, while that of the plain, at the foot of the eastern base of the coast range, is but 1,170 feet. The differences in level from east to west thus amount to 650 or 800 feet.

Central valley lands are the most fertile in the country, and agriculture there is an industry of considerable importance. This is also the most populous region and the site of the principal cities.

The third characteristic feature of Chilean territory is formed by the coast Cordillera, a range of origin more ancient than that of the Andes. Unlike the latter it exhibits no continuous incatenation, but is intersected at many points by larger or smaller gaps which give passage to the rivers that have their source in the Andean range and flow into the sea. The eminences which form this range have none of the abrupt appearance of the Andean chain; their slopes are for the most part gentle and ordinarily take the form of broad hills. It is seldom that their height exceeds 6,600 feet.

In the Tarapacá region the coast Cordillera appears to rise almost from the foreshore to heights which vary from 1,250 to 6,400 feet. In the district of the Atacama desert the summit-line reaches, on an average, rather less than 3,300 feet, but in the vicinity of Paposo the highest eminence is over 7,500 feet above sea-level. Between Taltal and Chañaral the line of the range runs in broken fashion, and one branch, which passes through the Placilla mining district, reaches and unites with the ramifications of the Andean range. Further south the Cordillera continues to mingle its branches with the spurs of the Andes until it reaches the vale of the river Aconcagua.

In the central region the chain which rises between the Aconcagua and the Maipo is notable as containing

many eminences of considerable elevation, such as the Roble, with its 7,290 feet, and the Campana, near Valparaiso, with 6,060 feet. South of the river Maipo the Cordillera trends further and further from the Andes, leaving between the two ranges the plains which form the great longitudinal valley. From the river Rapel southwards the range is less confused and much lower, taking, between the rivers Itata and Bio-Bio, the form of a broad ridge of but little elevation, with isolated hills. To the south of this latter river is the Nahuelbuta range, which extends to the river Imperial. South again of this river the Cordillera is low-lying, though at intervals occur eminences of some altitude.

Gradually the range becomes lower and finally it passes into the sea, from which, here and there, rise its highest peaks, forming the archipelagos which extend south of the Chacao Canal as far as Tierra del Fuego. Between these archipelagos and the continent are found great channels similar to the Scandinavian fjords, and these constitute the prolongation of the central valley.

CHAPTER III

MINERAL RESOURCES

FROM the geological point of view Chile is one of the most interesting countries for the study of the manifestations of the internal forces which have operated upon the configuration of the ground. The great volcanic cones, the thermal springs, the sulphur pits, the metallic seams, the carboniferous pockets, the deposits of nitrate, borax, rocksalt, and other substances, are not merely objects of scientific investigation ; they are the country's most important source of wealth. Confining ourselves strictly to the subject-matter of the chapter, we must consider the geological formation in its relation to the two great extractive industries which constitute the basis of the national economy—mining and agriculture.

The stratified formations pertaining to all the great geological periods are represented in Chile, and are distributed in reefs more or less parallel to the coast and Andean ranges, but intersecting them at a sharp angle and approaching nearer to the sea as they advance northwards. The azoic areas, composed of gneiss, mica schist, lustrous schist, slate and

quartzite, occupy, together with granitoid rocks, the south-west part of Tierra del Fuego, the Patagonian islands and the coast of the continent. In the Archipiélago de los Chonos granitic rocks seem to preponderate. The western coast of the island of Chiloé is composed of crystalline schistose rocks. North of this point these rocks constitute the western part of the coast range in the form of a reef which gradually narrows until it passes into the sea south of Caldera. The palaeozoic beds, composed of quartzose and micaceous sandstone with conglomerates of granitoid and crystalline rocks, bituminous slate and some calcareous strata, extend to the edge of the azoic formation from the province of Llanquihue to the east of the coast Cordillera. In Valparaiso they reach the shore, and further north they extend, alternating with granitoid rocks, to the neighbourhood of Taltal. Around the mouth of the river Choapa well-defined fossils have been disinterred which correspond to the Upper Devonian or Lower Carboniferous beds. The mezozoic beds pertaining to the Triassic, Jurassic and Cretaceous periods are composed of calcareous rocks with intrusions, and of marls and quartzose sandstone, but are especially characterized by the great preponderance of coloured porphyritic material. The Cretaceous formation has been found from the eastern side of the Andean Cordillera to the south of Patagonia; and

from the thirty-fourth parallel the calcareous strata extend towards the north. Opposite Santiago the secondary strata, traversed by granitoid rocks, extend from the Andean Cordillera on the east to Caldera on the west, and thence they advance, preserving the same distance from the coast, to Copiapó, subsequently shelving until they reach the sea a little to the south of Taltal. From here to Arica they spread from the coast to the ridge of the Domeyko Cordillera, interrupted by eruptive rocks of more modern origin and by *llanos* or plains overlaid with alluvion and *caliche* or nitrate deposits.

The tertiary formation is found along the coast and also enters by the mouths of the rivers, reaching the longitudinal valley and ascending to altitudes of not less than 1,650 feet above sea-level. In its lower strata are found deposits of lignite, which are worked in the neighbourhood of Punta Arenas and in Lota and Coronel. The tertiary strata appear on the northern side of the Straits of Magallanes, but are unknown or do not exist in the Patagonian islands or on the corresponding coast of the mainland. They occur in the northern part of Chiloé and, following the course of the longitudinal valley, spread below the quaternary alluvion. Along the coast they extend with unimportant interruptions from Llanquihue to Caldera. Further north they disappear, but the ancient level of the seabeach is

shown in the interior of Taltal, at the La Brea station, 2000 feet above sea-level.

The quaternary formation is manifested in the alluvia which in the longitudinal valley overlie the tertiary strata. These alluvions penetrate along the course of the rivers to far within the Andean range, and probably are due to the melting of the ancient glaciers of the glacial epoch.

To the quaternary period, and perhaps partly to the tertiary, belong the beds of sub-aerial origin with their various salts (amongst them saltpetre) which cover the desert of Atacama, and whose formation is variously attributed to the chemical decomposition of the feldspathic rocks, the action of the wind, or the accidental alluvia which throughout long intervals accumulated the materials formed by these agents.

In the geology of Chile eruptive rocks largely preponderate, occurring from the earliest epochs up to present times. It is to these that Chile owes the principal characteristics of its land-forms. They may be classified as granitoid rocks, which comprise sienite, granite, and diorite; quartziferous and feldspathic porphyries, basic trachytes and porphyries of dark and variegated colours. The granite-sienite and other granitoid rocks are found from Tierra del Fuego to the desert of Atacama. They form in Patagonia the greater part of the islands which extend to the south of the Archipiélago de los

Chonos, and also occupy great tracts in this region of the continent. In the centre and north of the country they are found in belts from the Andean Cordillera to the coast. Trachyte is the most usual form of Chilean volcano material. A large proportion of the volcanoes are found in the peaks of the Andean range ; in the provinces of the south they descend to the slopes and to the foot of the principal chain, while in Patagonia they are again found amongst the summits. They are very unequally distributed in the Andean Cordillera, for while there are long stretches exhibiting no trace of them, in other parts they form the highest peaks. In the coast Cordillera and the entire Patagonian archipelago there are neither volcanic craters nor volcanic rocks.

The metalliferous deposits are for the most part closely connected with the eruptive rocks. The true granites and also some quartziferous porphyries contain veins of gold besides seams of copper without gold ; the diorites, gabronites and homogeneous greenstone usually contain copper without gold or silver, and sienites are found with argentiferous lead-ores. The stratified variegated porphyrites display veins of copper with silver, especially when they are traversed by intrusions of felsites or quartziferous porphyry.

The metalliferous deposits occur in veins, in pockets or in placers.

In the sedimentary rocks small veins and nodules of auriferous quartz are frequently found amongst the crystalline schists. The calcareous and marly formations of the Jurassic epoch commonly contain veins with lead-ores, but only in certain strata, especially the bituminous. Cobalt and nickel occur in veins in the variegated porphyries and the diorites. Gold washings abound in the vicinity of the granites and crystalline schists.

In the northern region, where, on account of the infrequency of rains, the zone of oxidation has not been destroyed, it is easier perhaps than in any other part of the world to study the products of the oxidation and chloruration of the metalliferous deposits. The oxides, carbonates and oxychlorides of copper and of lead, and the chlorides, bromides and iodides of silver are found in abundance. In the centre and south of the country, i.e. in the rainy region, there are few oxidized metals.¹

The superficial layers of the geological formations have been rendered cultivable by the action of the atmospheric agents, by vegetation, and by the labour of man. Where these layers remain *in situ* they almost always participate in the nature of the rocks whence they originate, but such is not the case where they are water-borne lands. The arable bottom-lands

¹ Lorenzo Sundt, *Anuario estadístico de la Republica de Chile*, 1909, p. 66.

formed by eruptive rocks extend over much of the territory ; for the most part they are hillocks, hills and plateaux more or less broken up and only in a small degree irrigable. The deposits of sedimentary formation are stony and gravelly, and here and there cover large tracts. In the longitudinal valley and in the transverse or secondary valleys these deposits occur in conjunction with cretaceous or arenaceous sediments. The arenaceous beds are found especially in the longitudinal valley from the river Itata to the Bio-Bio and in the greater part of the beds and mouths of the rivers. The loamy lands, which occur principally in the Andean Cordillera, have no agricultural importance. Calcareous lands are rare in the south, and in the north, where they are more abundant, the lack of rain renders them almost incapable of cultivation.

To the class of modern alluvia belong the drifts of silicious sand known as *dunas* or dunes, common on the foreshore between the coast of Llico and that of Arauco.

The rivers are the great agents in the formation of bottom-lands, and play a very important part in the centre and the north of the country.

CHAPTER IV

CLIMATE

THE climate of Chile exhibits the characteristics of the various latitudes in which the territory is situated. In the north it is dry and hot ; in the central region it is temperate, with regular rains throughout the winter, and in the south the temperature is low (though not so low as in the corresponding zone of northern Europe) and rain is more abundant than in the centre. The configuration of the land contributes to augment this diversity of climates, for, in consequence of its gradual elevation from west to east, it is possible to pass out of the temperate zone of the coast up to the icy peaks of the Andes within the same latitude.

It is, therefore, obvious that the climate of Chile varies both according to its latitude and in respect of its height above sea-level. Given these circumstances, the territory may be separated into three zones : that of the coast, that of the longitudinal valley, and that of the Andean Cordillera, whose respective climates, with gradual modifications as they advance south, still preserve a character of their own.

As in our hemisphere, the seasons are the opposite to those of the northern hemisphere; the months of December, January and February constitute the Chilean summer, and those of June, July and August its winter.

In the coast zone the mean annual temperature varies little from one latitude to another. Thus in Iquique it is 64.4° Fahrenheit, in Caldera 60.8° , in Coquimbo and Valparaiso 59° , and 51.8° in Aucud. Between the eighteenth and twenty-fourth parallels the thermometer never sinks below 50° Fahrenheit nor rises above 86° ; between the twenty-fourth and thirty-sixth parallels it rarely descends below 32° or rises above 86° . Further south, however, the temperature falls considerably.

In the longitudinal valley the greater elevation of the land and its distance from the sea combine to establish important variations of temperature. In the north the climate is characterized by the extreme range of the diurnal and nocturnal temperatures. In the desert of Atacama, for example, at altitudes not exceeding 3,300 feet the thermometer not unusually rises during the day to 100° Fahrenheit and falls at night to 36° or 37.5° Fahrenheit. These variations are much less sensible in the south, for the reason that the vapour present in the atmosphere resists both the action of the sun and nocturnal radiation. In Santiago, which stands 1,820 feet

above sea-level, the temperature falls on winter nights to 27° or 28° Fahrenheit, and in the summer the *maximum* day range varies between 84.4° and 86° . Occasionally it snows, but the snow does not long remain on the ground, nearly always vanishing at the first rays of the sun, even at altitudes of over 2,600 feet. On clear June and July days the thermometer frequently rises as high as 68° to 77° Fahrenheit, but at night it falls to 32° or still lower. During the summer these variations are less marked, for the temperature of Santiago seldom exceeds 82.4° during the day or falls at night to below 53.6° . Such oscillations are due to the proximity of the Andean Cordillera, which in winter is covered with snow above the 4,600 feet line. The air cools at its contact and during the night spreads over the plain.

In the zone of the Andean range the temperature falls in proportion as the height increases, and is subject to wide variations at sunrise and sunset.

The winds which prevail in Chile depend upon the configuration of the land. The trade winds which blow from the south-east across the pampas of the Argentine Republic encounter the Andean range and, rising to the high regions of the atmosphere, only descend at a great distance from the coast. More frequent winds are those which proceed from the south, varying in each locality according to the season of the year and swinging from NNW. to SSW.

North of the thirty-ninth parallel, winds from the west and south-west (sea-breezes) make themselves felt. The east winds are merely local (land-breezes) and blow from the Andean range. The mornings are as a rule calm, and the south-west winds which in Chile take the place of trade winds commence towards midday. They are light at their onset and increase in intensity until 3 or 4 o'clock in the afternoon, when they begin to decline, usually disappearing after sunset. These winds suffer deviations upon striking the coast Cordillera, taking a northerly direction and producing, with the influence of the Andean range, the strong southerly winds which prevail during the summer. The winds from the colder regions are dry and bring fine weather with them.

In those parts where the maritime Cordillera ascends to great heights the strata of air cooled on the mountain peaks descend to the sea, where, meeting a warmer and more humid air, they produce the mists which in the mornings prevail along the coast.

South winds and westerly breezes contribute largely to the tempering of the summer heat.

Between the thirty-ninth and forty-sixth parallels north-west winds prevail from November to March. These are hot and moist and usually bring rain.

South of the forty-sixth parallel the dominant winds are those from the Pole which blow in Patagonia and Tierra del Fuego. At Cape Horn the

average velocity of the wind increases steadily from September to January, when it decreases until April. During May and June the wind is generally a light intermittent breeze. Storm-winds usually blow from NW. and SSW.

The mountain chains which traverse the territory from north to south are sources of modifications in the general system of the climate and the winds. The bleakness of the northern areas and the exuberant vegetation of the southern region are, in their turn, influences which modify and alter the hygrometry of the air. The quantity of water-vapour contained in the atmosphere varies in inverse ratio to the latitude, and, as opposed to what happens in other parts, the rains are most abundant furthest from the Equator.

In Tarapacá rain is unknown except in certain districts. In the desert of Atacama not a drop of water may fall for several years ; showers there are purely local and come from storms which arise over isolated mountains.

Between the twenty-seventh and twenty-ninth parallels rain is less rare, for even when it happens that for one or two years no rain falls on the plain, storms supervene in the Andean Cordillera and the snow feeds the nearest rivers which flow into the sea. Between the twenty-ninth and thirty-second parallels it rains at least once a year.

Further south the depth of rain and the number of days on which it falls increase progressively as far as the province of Valdivia.

North of parallel 37° rains are more frequent in the western region of the coast Cordillera than in the central valley, but towards the south they have a more general character, extending over all the area comprised between the Pacific and the Andes. Localized to the south of the thirty-eighth parallel during the months from November to March, they then begin to spread north, following the sun's progression. The first rains fall generally in the region lying within the thirty-eighth and thirty-fifth parallels, and subsequently they extend more to the north.

Rains are most frequent during June and July, when the sun is near the solstice, and they fall not only in the central region but also in the province of Coquimbo. After July they recede further and further, until in December they are again confined to areas south of the thirty-eighth parallel.

Snow-storms are known only in the Andes and in the southern regions, rarely descending upon the plains. The snow-falls of the Cordillera are most frequent in autumn and winter; in the summer months they are neither abundant nor much to be feared.

In the longitudinal valley the commonest pheno-

mena are torrential rain-storms which fall for several successive days, especially to the south of the thirty-eighth parallel.

In Tierra del Fuego and the seas which surround it the normal state of the atmosphere, even in the middle of summer, is tempestuous. The temperature of this season is higher than in winter, but the winds blow with more violence and there are fewer days of sunshine.

The hygrometric state of the air exhibits the peculiarities of the various regions—moist in the southern provinces and dry during the summer in the central and northern regions. The highest degree of relative humidity coincides with the rainy season and the lowest with the hot season. In this latter period a great discrepancy is observable in the degree of air-saturation, which decreases with the heat instead of increasing.

The hourly variation is very regular ; the barometer rises every morning until 9 or 10 o'clock and thereafter falls until 4 o'clock in the afternoon, reaching the maximum again at the end of six hours. The greatest irregular variations occur in June, July, and August north of the thirty-sixth parallel, and in January, February, and March south of that latitude. Winds from the west and the north-west produce a fall of the barometric pressure, which rises with southerly and south-west winds.

The Humboldt current which travels along the western coast of South America, forming a river of icy water from Chiloé to Ecuador, exercises a considerable influence upon the Chilean climate. It refreshes the coasts, especially in the arid, droughty and sandy regions of the desert of Atacama and the pampas of Tarapacá, and contributes to the formation of the equable, temperate and healthy climate which characterizes the maritime zone of the territory. The coast of Chile is from 4 to 5 degrees colder than the eastern coast of the United States.

The central region of Chile, in which has been formed the greatest nucleus of its population, its commerce, and its culture, is highly favoured in comparison to the rest of the country by the benignity of its climate, for in no part of the coast or of the longitudinal valley does it suffer the rigours of extreme and inclement seasons such as obtain, in certain periods of the year, in many analogous regions of Europe or the United States.

The mildness of the seasons, the absence of meteorological phenomena which in other parts cause destruction and catastrophes, and the general beneficence of the climate of Chile render it one of the most suitable countries for the development of the physique, the formation of a vigorous race, and the exploitation of every class of industry.

CHAPTER V

RIVERS AND LAKES

THE most important rivers of Chile rise in the Andean Cordillera at a short distance from the coast, and their system is subordinated to the climatological conditions of the regions which they traverse. North of the twenty-eighth parallel they carry but little water, and between the thirtieth and thirty-fifth degrees they are mere torrents, but in the south they acquire the volume and the smooth flow of the great rivers. As to the lakes, the most notable are to be found in the southern region, either in the centre or at the feet of the Cordillera de los Andes.

In the northern district, from the river Sama to the end of the desert of Atacama, there are but two permanent streams which reach and flow into the sea. The first is the river Azufre, which waters the province of Tacna, and the valley which it traverses, known as the *quebrada de Lluta*, is very fertile and variously cultivated. In the province of Tarapacá small rivulets which descend from the Andean Cordillera are utilized industrially and agriculturally. In the pampa del Tamarugal the subterranean

current which exists beneath the plain, and feeds the wells that have been sunk there, constitutes an invaluable auxiliary to the exploitation of the nitrate deposits. The second permanent stream to which we have referred is the Loa, whose waters are utilized for the irrigation of the region around Calama—a veritable oasis of the desert—and as a motive force provide power for some installations recently established. In the remaining rivers the greater part of the water is lost by evaporation and the rest filters into the soil, to reappear here and there in the form of small springs, whose water, laden with saline substances, is unfit for drinking purposes.

To the south of Atacama the river Huasco is the first to reach the sea, and thereafter commences the second hydrographic region of the territory, which comprises no less than eighteen important rivers, distributed in a particularly uniform manner. From these rivers is derived the water for irrigation in the longitudinal valley and the transverse valleys.

The rivers of the second hydrographic region, which extends to the thirty-fifth parallel, are subject to two annual floods. The first corresponds to the rainy season, and is extremely variable ; the second is the result of the melting of the snows and occurs during November and December. In these months the rapidly melting snow slips in great masses down the flanks of the mountains, carrying with it the

... and close
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and July, when the rivers flow turbidly and frequently
overflow their banks.

As the sources of these rivers are found at con-
siderable heights, while their course is relatively
short, they invariably exhibit in their upper and
middle parts, and often indeed in their lower course,
sharp inclinations which could easily be utilized for
the generation of hydraulic motive power, and

Concepción Bay and San Vicente Bay, may be recognized by two notable hills, some 800 feet in height, called the Tetas del Bio-Bio, which rise towards the north of the entrance. This river is not navigable on account of its sandbanks.

The river Imperial discharges, at latitude $38^{\circ} 49'$, at the foot of the Cholhui hill, south of which there is a small bay into which Lake Budi sometimes drains. From its mouth to the confluence of the Mocho or Mocul its course is almost from north to south, with a breadth of some 440 yards. Towards its left bank there are a few shoals, but close under the right bank there are 18 feet of water when the tide is flowing at a rate of two to three miles an hour. The ~~short time to time the bed of the~~ river crosses its forms nevertheless a hydrographic basin ~~and of the~~ importance. Other notable rivers of Chile are the Coquimbo, Limari, Choapa, Aconcagua, Maipo, Rapel, Mataquito, Maule, Itata, Bio-Bio, Imperial, Tolten, Valdivia, Rio Bueno, Maullin, Palena, and some large streams in Chilean Patagonia.

From the navigation point of view Chilean rivers may be divided into two categories, the first embracing the rivers navigable by vessels drawing 9 feet of water and the second comprising those which are navigable only by small craft.

The most important are the following :

The river Maule ($35^{\circ} 18'$ south latitude).—At a

rocks and earth which lie in its path and which are thus precipitated to the bottom of the torrent. It is for this reason that these streams, in their course through the longitudinal valley, are invariably turbid and deposit a large quantity of mud, which is to the Chilean plains what Nile mud is to the lands of Lower Egypt. These floods, which continue for several months, begin to slacken (though their waters remain swollen and muddy) at the beginning of January. In February they reach their *minimum*, but do not recover their clearness until March, when the melting of the snow is over.

In the rivers situated south of the thirty-fifth parallel the summer flood is not particularly appreciable. The water from the melting of the first snows sinks into the soil of the forests which hereabouts cover the Andean Cordillera, and is relieved of the earthy matter accompanying it, so that these rivers preserve their limpidity throughout the fine-weather season. The great winter floods occur during June and July, when the rivers flow turbidly and frequently overflow their banks.

As the sources of these rivers are found at considerable heights, while their course is relatively short, they invariably exhibit in their upper and middle parts, and often indeed in their lower course, sharp inclinations which could easily be utilized for the generation of hydraulic motive power, and

especially for the installation of central electric power stations for the transmission of mechanical energy over long distances. The network of rivers which covers Chilean territory would permit of the utilization throughout the country, and with comparative facility, of the power permanently developed by these streams.

The country possesses two kinds of hydrographic basins—the great depressions which extend from the Cordillera de los Andes to the sea and the lesser hollows which collect the streams from the western watershed of the coast range. We have spoken of the rivers which are found in the northern region, and we should here mention the Copiapó, which, although from time to time it fails to empty into the sea, forms nevertheless a hydrographic basin of a certain importance. Other notable rivers of Chile are the Coquimbo, Limari, Choapa, Aconcagua, Maipo, Rapel, Mataquito, Maule, Itata, Bio-Bio, Imperial, Tolten, Valdivia, Rio Bueno, Maullin, Palena, and some large streams in Chilean Patagonia.

From the navigation point of view Chilean rivers may be divided into two categories, the first embracing the rivers navigable by vessels drawing 9 feet of water and the second comprising those which are navigable only by small craft.

The most important are the following :

The river Maule ($35^{\circ} 18'$ south latitude).—At a

distance of 4 miles NNE. of Cape Humos, and close inshore, rises a rock which from its resemblance to a church has been given the name of La Iglesia. One mile further north stands a remarkable whitish rock, 80 feet in height, and known as the Lobos, which marks the mouth of the river Maule. The entrance cannot well be mistaken for the reason that from the south side the ground is high and the coast rugged, while from the north the low and sandy shore extends for a considerable distance. The city of Constitución is situated on the south bank of the river one mile from its mouth. The whole district is very fertile and the interior can be reached by means of this beautiful river, at whose mouth, however, there is a bar ~~which is constantly shifting~~. From September to February the channel forms close to the Lobos rock, and has a depth of 11 to 16 feet at low tide. In March and April the channel shifts gradually towards the north until it lies in the middle of the entrance, or even further north, with from 6 to 8 feet at low tide. In May the rains begin and the ebb-tide, flowing at a rate of from 4 to 6 knots, renews the bar which forms from north to south, the channel returning to its position near the Lobos rock. The anchorage known as La Poza is from 16 to 26 feet deep almost opposite the city.

The river Bio-Bio is situated at 36° 49' south latitude, and its position, together with that of

Concepción Bay and San Vicente Bay, may be recognized by two notable hills, some 800 feet in height, called the Tetas del Bio-Bio, which rise towards the north of the entrance. This river is not navigable on account of its sandbanks.

The river Imperial discharges, at latitude $38^{\circ} 49'$, at the foot of the Cholhui hill, south of which there is a small bay into which Lake Budi sometimes drains. From its mouth to the confluence of the Mocho or Mocul its course is almost from north to south, with a breadth of some 440 yards. Towards its left bank there are a few shoals, but close under the right bank there are 18 feet of water when the tide is flowing at a rate of two to three miles an hour. The shoal which forms the bar of the river crosses its mouth from north to south, leaving a channel to the southwest of Cholhui and another to the west. The mouth is practicable for vessels drawing not more than 8 feet, but vessels of deeper draught can enter during the rainy season. It is navigable by vessels of the draught mentioned to about 19 miles from its mouth, as far as the city of Carahue, which is situated on its left bank, and forms the terminus of the railway that links it to the central railway-system in Temuco. As the influence of the tides reaches some 21 miles inwards from the mouth, small craft can navigate far into the interior. The surrounding region is a very important one and

constitutes one of the wheat-growing centres of the country.

The river Tolten is situated at $39^{\circ} 15'$ south latitude. The depth of water over the bar is as much as 10 feet, but breakers are constant and only those vessels can enter which draw less than $6\frac{1}{2}$ feet. Past the bar the depth of water increases gradually to 25 feet up-stream. The banks of the river abound in timber.

Valdivia is the name given only to that portion of the river Calle-Calle which is situated between the port of Corral and the city of Valdivia. The mouth of this river ($39^{\circ} 15'$) has a variable channel full of shoals, which occasionally obstruct navigation and only admit vessels drawing less than $9\frac{3}{4}$ feet of water. In former times the river Torna-Galeones offered a greater depth, though the route was longer, but it has now been reduced at many points. Large vessels discharge in Corral and their cargo is transported in 60-100 ton lighters to Valdivia, which city lies 9 miles from Corral on the left bank of the river. In the port of Corral large foundries have been erected for the manufacture of iron and steel.

Five and a half miles north of Milagro creek the coast recedes and forms a small bay into which, at $40^{\circ} 16'$ south latitude, flows the Rio Bueno. This bay is quite unsheltered from the winds, with the result that the

surf is heavy and almost continuous. The depth of water outside the bar varies from 4 to 8 fathoms. The Rio Bueno rises in Lake Rauco at the foot of the Andes, and is notable for the depth of its stream. Its entrance is obstructed by a bar of shifting sand, and the depth of its channel depends upon the time of the year. The greatest depth over the bar is 7 feet in summer and 15 feet in winter, but occasionally the surf prevents access to the river. Small vessels can cross the bar in fine weather and steam as far as Trumao, 50 miles distant, but sailing vessels cannot enter on account of the current, which at times attains a velocity of three to four miles per hour.

The river Maullin ($41^{\circ} 36'$ south) discharges into the north-east part of the Choronzos gulf. It has its source in Lake Llanquihue, at the foot of the Cordillera de los Andes, and is navigable by vessels drawing $9\frac{1}{2}$ feet of water for 26 miles from its mouth. Its entrance opens on a wild shore, low-lying and exposed to fierce winds, and, except during fine weather, it is very difficult to make the river. The port of Maullin, $2\frac{1}{2}$ miles south of the entrance, has some 500 inhabitants. There is good anchorage, with about 4 fathoms of water, towards the north of the town.

The river Yelcho ($42^{\circ} 57'$) is without doubt the largest in Chile. Its length is over 125 miles and it carries a heavy flow of water. Emptying into the

Corcovado Gulf it drains Lake Yelcho, situated at a distance of 35 miles above its mouth. This lake is 17 miles in length and from $3\frac{3}{4}$ to $5\frac{1}{2}$ miles in breadth, and lies at an altitude of 210 feet above sea-level. Before it enters the lake the river is known as the Futaleufu, and flows across the boundary-line between Chile and Argentina at a distance of some 32 miles from the lake. Continuing inland it collects, in a course of 42 miles, the surplus waters of the lakes Menendez, Barros Arana (1,650 feet above sea-level) Jorge Montt, Bravo, and Nicolas (1,870 feet above sea-level). The Yelcho is navigable as far as the lake of the same name, and even further for light-draught steamers. The entrance is low-lying and here the river divides, forming several mouths.

The river Palena flows, at $43^{\circ} 46'$ south latitude, into the south-west of the Corcovado Gulf. It is navigable up to its first rapids, a distance of 22 miles, by vessels drawing 9 feet of water. The entrance is obstructed by a bar of shifting sand, which leaves a channel that varies according to the time of the year and the weather prevailing in the gulf. Past the bar depths are found at low tide of 15 to 21 feet. Soundings generally give irregular results, but the river always affords a channel of not less than 11 feet in depth, and in some parts a depth of as much as 66 feet is found. The ebb-tide has a velocity of two

to four miles an hour. Above the first rapids the current is very strong and at every half-mile there are other rapids. The Palena flows across the frontier line with Argentina at a distance of 89 miles from its mouth and continues into Argentine territory for a further 69 miles, as far as Lake Palena, in which it has its source.

Further south are the rivers Aysen, Baker, and Pascua. The first is navigable for $7\frac{1}{2}$ miles, to near the first rapids, and the stream is broad and full, with an average depth of 18 feet. Its entrance is by a narrow channel 13 feet deep at low tide. The Baker has a length of 97 miles and rises in Lakes Buenos Aires and Cochrane. The Pascua is also a river with plenty of water, but its current is very strong. Small boats can get as far as the first rapids, 22 miles from its mouth. It rises in Lake San Martín and flows for 35 miles through a narrow channel.

To complete the description of the hydrographic aspect of Chile we should now refer to the lacustrine region, which also exhibits interesting characteristics from the point of view of industry and civilization.

The principal lakes are found in the provinces of Valdivia and Llanquihue and are as follows: Llanquihue, which has an area of 286 square miles; Rauco, 196; Villarrica, 96; Puyehue, 63, and Todos Santos, 50 square miles.

Steam navigation has been established on Lakes Llanquihue and Todos Santos. In this region, thanks to the excellence of these lakes as means of communication, some little trade with Argentina is being developed.

CHAPTER VI

POLITICAL DIVISIONS

THE territory of Chile may be separated into several distinct regions, each differing substantially from the other in respect of physical characteristics and natural resources.

Regarded physically Chile falls into four zones. The first, the nearest to the Equator, extends between the eighteenth and twenty-seventh parallels of latitude south, and comprises the provinces of Tacna, Tarapacá, Antofagasta, and part of the desert of Atacama. In this zone the valleys are narrow and the streams which fertilize them are scanty, originating solely from the melting of the snows in the Andean range. Rain is rare, and the quantity of water that falls has no effect upon the rivers which cross these regions. Vegetation is confined to certain valleys ; it is poor in the vicinity of the coast but more vigorous as it approaches the Andean region, in whose ravines it thrives and develops. Agricultural products consist principally of fruit-trees, garden stuff, and fodder plants, which latter are used for the fattening of beef-cattle and sheep.

The mineral kingdom includes immense saline deposits and rich metalliferous veins.

The second zone covers the area from the southern end of the desert of Atacama to the beginning of the longitudinal valley, and comprises, politically, part of the province of Atacama and the whole of the provinces of Coquimbo and Aconcagua. The valleys which it contains are of greater dimensions than those of the preceding zone ; they are better irrigated, and their rivers in every case reach and discharge into the sea at all seasons of the year. Throughout this zone agriculture is of the most varied nature, especially in respect of fruit-growing. The vine is very successfully cultivated and excellent wines are produced. The principal industry, however, is mining, many copper, silver, iron, manganese, lead, and other mines being exploited.

Further south, between parallels 32° and $43^{\circ} 30'$, is the third zone, the mid-southern, which comprises the provinces of Valparaiso, Santiago, O'Higgins, Colchagua, Curicó, Talca, Linares, Maule, Ñuble, Concepción, Arauco, Bio-Bio, Malleco, Cautín, Valdivia, Llanquihue and part of the province of Chiloé. In this zone the great longitudinal valley separates the Cordillera de los Andes from the coast ranges. Over most of its extent the land is watered by numerous rivers, which cross the territory from east to west. Vegetation is of vigorous growth and

increases as it advances south. The forests abound with timber and firewood of excellent quality, and agriculture and cattle-rearing have reached an advanced stage of development. The mineral kingdom is notable for the large deposits of fossil coal and lignites which exist on the coast and extend inland as far as the longitudinal valley within the area of the provinces of Concepción and Arauco.

The last zone is the southern or austral, which is situated between parallels $43^{\circ} 30'$ and 57° , embracing the region of the archipelagos, the continental belt of Chilean Patagonia, and Tierra del Fuego, i. e. the southern part of Llanquihue, the province of Chiloé, and the whole of the Magallanes territory. Here the longitudinal valley disappears and is replaced by the gulfs and channels which extend south of Reloncaví. The western slopes of the Andes descend into the sea and the coast Cordillera breaks up into islands which preserve the geological formation. The entire zone abounds in forests and in lands suitable for cattle-rearing, this and timber-cutting being the principal industries. The fishing industry in this zone has immense possibilities.

If the division of the territory in respect of its physical peculiarities corresponds more or less exactly to the four zones which we have enumerated, classification from the industrial point of view is simplified by considering only its climatological

conditions and its principal products, which fall into three well-defined regions :—

The northern region, characterized by its nitrate and metallic wealth, comprising the provinces of Tacna, Tarapacá, Antofagasta, Atacama, and Coquimbo.

The central region, characterized by its agricultural products, proper to the temperate zone, and embracing the provinces of Aconcagua, Valparaiso, Santiago, O'Higgins, Colchagua, Curicó, Talca, Linares, Maule, Ñuble, Concepción, Arauco, Bio-Bio, Malleco, and Cautín, that is to say, the most populous and most productive part of the country.

Finally, the southern region, characterized by the abundance of its forests, and comprising the provinces of Valdivia, Llanquihue, Chiloé, and the territory of Magallanes and Tierra del Fuego.

Administratively the country is divided into provinces, with subdivision into departments. The latter are divided into sub-delegations and these again into districts.

There are twenty-three provinces and one colonization territory—that of Magallanes, which also includes Tierra del Fuego. Local government is in the hands of municipalities, of which there are 216.

The area of Chile is calculated at 292,102 square miles, of which approximately 116,800 are occupied by the northern provinces, 56,470 by the central

POLITICAL DIVISIONS

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provinces, and 115,500 by those of the south, as shown in the following table :—

NORTHERN REGION		Sq. Miles
		Forward 25,761
Tacna . . .	8,994	Linares . . . 3,937
Tarapacá . . .	16,675	Maule . . . 2,779
Antofagasta . . .	46,358	Ñuble . . . 3,474
Atacama . . .	30,687	Concepción . . . 3,281
Coquimbo . . .	14,089	Arauco . . . 2,161
	<u>116,803</u>	Bio-Bio . . . 5,327
		Malleco . . . 3,281
		Cautín . . . 6,469
		<u>56,470</u>
CENTRAL REGION		
Aconcagua . . .	5,404	
Valparaíso . . .	1,637	
Santiago . . .	5,867	
O'Higgins . . .	2,161	
Colchagua . . .	3,821	
Curicó . . .	3,011	
Talca . . .	3,860	
	<u>Forward 25,761</u>	
SOUTHERN REGION		
		Valdivia . . . 8,955
		Llanquihue . . . 34,740
		Chiloé . . . 6,948
		Magallanes . . . 64,848
		<u>115,491</u>

In respect of their utilization for the purposes of cultivation the lands may be classified under four heads: irrigated land, unirrigated land, forest land, and barren land occupied by mountain chains, pampas and deserts. The area of each is approximately as follows :—

Cultivated lands	7,720	square miles
Unirrigated „	38,600	„
Forest „	77,200	„
Barren „	155,980	„

Lands irrigated by artificial means form 2.5 per cent. of the total. The area occupied by the longitudinal valley and the transverse valleys is estimated as 14,440 square miles, and consequently not more than half of the available area of the country's richest zone is cultivated.

The area occupied by natural pasture lands is 13 per cent. of the total. In great measure they comprise the lands suitable for cattle-rearing in Magallanes and Tierra del Fuego.

Forest lands cover 26.5 per cent. of the total area, and it is estimated that at least half of them could be used for agricultural and industrial purposes.

The barren lands, which, as we have seen, are occupied by the Andean and the coast ranges and the pampas and deserts of the north, form 57 per cent. of the territory. From an industrial point of view it is in these tracts that the most important sources of wealth are found, for here lie the almost inexhaustible deposits of *salitre* or nitrate of soda, and the richest, most varied, and most abundant metaliferous lodes in South America.

For the rest, much land which in the north of the country now figures as dead ground, barren from lack of rain, will be transformable into magnificent cultivable soil upon the completion of the dams and reservoirs for the winter flood waters, and of other hydrological works which are projected.

The great longitudinal extension of Chile offers an adequate field for the development of industries of every description, and the diversity of the products of the various zones makes that active interchange of merchandise possible which maintains the prosperity of a country's commerce.

CHAPTER VII

DISCOVERY AND CONQUEST

IN the year 1534 a Royal Licence issued under the hand and seal of the Spanish monarch conceded to the *capitan* Don Diego de Almagro, for conquest and colonization, the region extending to the south of Perú. Almagro undertook the mission in person, and, leaving Cuzco towards the middle of 1535, crossed the plateaux of the Andes and reached Copiapó after six months of hardship and sufferings. Thence he descended into the valley of Aconcagua, discovering a region which its inhabitants called *Tchili*, probably from a word meaning, as some think, 'cold,' and as others hold, 'beautiful.' Not finding the riches which he sought, Almagro withdrew without fulfilling any of the purposes of his visit, founding no great and powerful kingdom and leaving untouched the hidden wealth of precious metals.

The failure of the enterprise in no way damped the covetous ardour of the Spaniards, and in 1540 another *capitan*, Don Pedro de Valdivia, of the armies of Pizarro, formed at his own expense a troop

of expeditionaries, and, after a march of hundreds of leagues along the coast, overcoming the natural difficulties of a toilsome journey across the wastes and beating back the savages who opposed his advance, reached the banks of the Mapocho. The amenity of the site, its strategic value against the attacks of the natives (who, when subdued, would provide labour for agriculture and for the mines which he proposed to exploit), and the fertility of the fields which they cultivated, all persuaded Valdivia to establish his camp in the district, and on February 12, 1541, he solemnly drew up the minutes of the foundation of the city of Santiago de la Nueva Estremadura, so styled in honour of the patron saint of Spain and of the province in which Valdivia was born. Later on he organized expeditions, conquering his way, after desperate battles with the Indians, to the shores of the river Calle-Calle, where he built the city named after him. Subsequently he founded other cities, La Serena, Concepción, and Imperial, and established several forts in the south to withstand the attacks of the Indians.

Valdivia's successors continued the work of pacification and colonization, frequently embarrassed by the tenacious resistance of the Araucanos, the primitive inhabitants. Governor Don García Hurtado de Mendoza rebuilt Concepción and Angol, which had been sacked by the Indians, founded

Canete and Osorno, and dispatched an expedition, under the command of the famous *pilotos* Ladrillero and Cortes de Ojeda, to reconnoitre the southern coasts and the Strait of Magallanes, discovered in 1520, of which they took possession, in 1557, in the name of the King of Spain. Since this date the Strait has remained under Chile's jurisdiction.

With the termination of the period of the conquest began the organization of the colony, whose completion of three centuries of existence was signalized by the scientific expeditions dispatched to study the country and by the founding of numerous towns and cities.

During Don Rodrigo de Quiroga's government General Don Martín Ruiz de Gamboa founded by his order, in 1567, the city of Castro, and, in 1580, Chillán. Don Alonso Sotomayor founded Arauco in 1591, and Lebu and Nacimiento were founded by Don Alonso de Rivera in the period 1601-5.

Between 1692 and 1700 Chimbarongo, Taltal, Itata, and Rere were founded by Don Tomas Marin de Poveda. The founding of Quillota by Don José de Santiago Concha followed in 1717; of San Felipe by Don Antonio Manso de Velasco in 1740, of Los Angeles and Cauquénés in 1742, of Melipilla, Rancagua and Curicó in 1743, Copiapó in 1744, and San Fernando in 1745; all by the same Velasco.

Don Domingo Ortiz de Rosas, known as *Conde de Poblaciones*, founded Quirihue, Coclema, Florida, Casablanca, Petorca, Ligua, and Illapel between 1746 and 1755. Don Antonio Guilly Gonzaca founded Rere, Yumbel, Tucapel, and Talcahuano, and also translated Concepción to the site on which it stands to-day.

Finally, Don Ambrosio O'Higgins founded during the period 1788-96 the cities of Santa Rosa de los Andes, Combarbald, Vallenar, Constitución, San José de Maipo, Linares, and Parral.

The Republic organized, the Government perceived the necessity of peopling the vast territory of the south of the country, and, attacking the problem vigorously, succeeded by 1851 in establishing foreign colonies in the provinces of Valdivia and Llanquihue. The valiant Araucanian tribes, however, still retained the territory between the rivers Bio-Bio and Tolten, from the sea to the Cordillera, and the state of insecurity in which the boundary region remained by reason of the depredations of the Indians led the Government, in 1861, to undertake the pacification of Araucania. By 1883 the entire territory was subdued and incorporated under the laws of the Republic. The lands which the Araucanos had defended with such valour were given over to colonization; a network of railways grew across them, and numerous towns sprang up which now are

flourishing cities, like Victoria, Temuco, Traiguen, Collipulli, and others.

Of recent years the efforts of the State have been directed towards the colonization of the territory of Magallanes, where to-day the cattle-rearing industry prospers wonderfully, its capital, Punta Arenas, being the centre of considerable commercial activity.

CHAPTER VIII

THE POPULATION

THE anthropo-sociological composition of Chile is the outcome of the currents of *conquistador* invasion, the elements of the native races, and the conditions of their environment.

Before the Spanish conquest Chilean territory was inhabited by three native races, which differed one from the other in virtue of well-defined characteristics. In the north, and especially in the Atacama littoral, lived the Changos, of Aymará origin ; the district west of the Andes, from Copiapó to Chiloé, was inhabited by the Mapuches or Araucanos, a race of hardy and warlike tribes each of which derived its name from the region which it occupied ; and lastly the Fueguinos (a generic name used to designate the race of the Onas, Yaganes, and Alacalufes) dwelt in the southern archipelago, in Patagonia and in Tierra del Fuego.

The Mapuche or Araucano race occupied the greatest extent of territory, and everything points to the probability that they had been settled there since

a remote epoch. The Chilean Indians did not form a body politic with a common denomination, but were separated into tribes distinguished by the designation of the territories in which they lived. Those in the north were called Picunches ; Puelches were those who dwelt in the east and in the valleys of the Andes, and Huilliches were the southern tribes, but these denominations were vague and indeterminate. Even the name of *Araucanos* which the Spaniards applied to the natives was unknown to them, and the probability is that it is derived from a Quechua or Peruvian word meaning 'enemies'.

Under Spanish dominion these races were greatly reduced, but they were not totally exterminated, and even to-day, when three hundred years have elapsed, representatives exist of the ancient owners of the soil.

Of the races mentioned, the Araucano, and in particular the Pehuenche tribe, which inhabited the district lying between the Bio-Bio and the Tolten, was the finest type, breeding warriors who fought valiantly and tirelessly in defence of their native land, undaunted by innumerable defeats sustained in their long wars with the armies of Spain.

From the intercourse of the Spaniards with the native women sprang the present race, in which traces survive of ancestors on either side, though the

mental and moral characteristics of the superior breed have prevailed.

In the early times of the conquest there was no particular class of Spaniards ; those who came to America were the bold, adventurous spirits of the period, and with them came other Europeans—Flemings and Portuguese and Italians—whose influence can be traced in Chile. But from the intermixture of inferior races such as the African, which has gained such a hold in other parts of the continent, Chile has fortunately been free.

It may be said, then, that the mass of the population of Chile is of pure European descent with traces of the aboriginal, forming a homogeneous people with the characteristics of the superior races.

The historian Don Toribio Medina estimates the population of Chile at 500,000 at the time of the arrival of the Spaniards, but although no trustworthy data exist to contradict him these figures seem exaggerated. The population was very unequally distributed ; in the north, between Copiapó and Aconcagua, there were not more than 3,000 Indians, though their numbers increased further south. The most populous districts were those beyond the Bio-Bio and in the island of Chiloé.

As to the *conquistadores*, their numerical strength was not very considerable. Towards the end of the

sixteenth century the male population of Spanish origin did not exceed 2,000, of which a quarter lived in Santiago and the rest were distributed amongst nine small cities—La Serena, Chillán, Concepción, Angol, Imperial, Villarrica, Valdivia, Osorno, and Castro. About 1630 their total would be less than 8,000 or 9,000. In 1730 the number of inhabitants was calculated to be approximately 80,000, and forty years later this figure was increased by half.

In 1791, under the Presidency of Don Ambrosio O'Higgins, the ecclesiastical authorities conducted a census of the population of Chile which returned 203,732 inhabitants for the Bishopric of Santiago, and 105,114 for that of Concepción. Some years previously a census taken in Chiloé returned the population of the islands as 26,703 souls. Estimating the independent population of Araucania as approximately 120,000 Indians, Chile may be reckoned to have had towards the end of the eighteenth century from 350,000 to 400,000 inhabitants.

The population of Chile in 1810, the period of the Independence, is calculated to have been 500,000. The War of Independence and the political and social disturbances which preceded the definitive organization of the country did not permit of statistical investigations, but when peace was declared in 1831 a first partial census was taken, being completed in

1835. This census returned the population of Chile as 1,010,332 inhabitants. Since that date a census has been taken more or less regularly every ten years.

The last census, that of 1907, credited Chile with a population of 3,249,279 inhabitants, a figure which, compared with that of the preceding census (1895), shows an annual increase of 1.52 per cent. This compares favourably with the annual numerical advance of countries more favourably situated in this respect, that of Germany being 1.10 per cent. and that of Japan 1.19 per cent.

It should be remembered that the development of Chile's population has been due exclusively to physiological or natural increment. Foreign immigration, unfortunately, does not contribute, as in other countries, to its augmentation, the difficulties of communication and the distance which separates Chile from the principal European nations militating against the influx of any appreciable current of foreign peoples.

To form an idea of the density of the population in comparison with the territory it will not be sufficient merely to quote the total figures of the census in conjunction with the area. The physiological conditions of the various regions being so unequal, it is necessary to study the country according to the zones into which nature has divided it, and

for this purpose the territory may be considered under the following sections :—

<i>Zones</i>	<i>Area</i>	<i>Population</i>	<i>Density</i>
Nitrate . .	73,958	252,107	3·4 per sq. mile
Mining . .	44,158	238,989	5·4 " "
Central . .	13,085	926,741	70·8 " "
Agricultural	26,055	1,093,339	41·9 " "
Araucanian	24,820	527,111	21·2 " "
Antarctic .	110,126	210,992	1·9 " "
	292,202	3,249,279	Av. 11·12

In this repartition the nitrate and mining zones comprise the northern provinces ; the central and agricultural zones embrace the provinces of Aconcagua and Concepción ; the Araucanian zone consists of the provinces of Arauco and Valdivia, and the antarctic zone of Llanquihue and Magallanes.

As may be seen by the foregoing table, the central, agricultural, and Araucanian zones, comprised of the provinces of Aconcagua and Valdivia (that is to say the best cultivated region, with an area of only 64,000 square miles—less than a quarter of the whole territory), contain 2,547,000 inhabitants, leaving but a fifth of the population for the arid zones of the north and the forest lands of the extreme south.

The proportion of the sexes in Chile is exceptionally well balanced, for there are 1,624,221 males and 1,625,058 females, a female majority of only 837. This naturally does not mean that the sexes preserve this

numerical equality throughout the country; females predominate in the urban districts and males in the rural parts. In the provinces of the north and the extreme south the number of females is very limited.

The proportion of foreigners which figure in the population of Chile is particularly small, amounting only to 134,542, or 41 per 1,000. Of these 27,140 are Peruvians, 21,968 Bolivians, 18,755 Spaniards, 13,023 Italians, 10,724 Germans, 9,845 English, 9,800 French, 6,956 Argentinos, 3,813 Austrians, 2,080 Swiss, and the remainder of various nationalities.

The total number of Araucanian Indians in the country is, according to the census of 1907, 101,118, distributed over the provinces of Bio-Bio to the south as far as the Gulf of Reloncaví, many of them forming part of the working population of this great region.

Nearly all the inhabitants profess the Roman Catholic faith, but all religions are tolerated.

The proportion of illiterates is 60 per cent., and shows an appreciable decrease at each census. It is considerably lower than in many other South American countries.

To every 1,000 inhabitants there are 656 unmarried, 268 married, and 76 widowed.

Considering the movement of the population over

long periods of time the co-efficient of the marriage-rate may be calculated at 5·5 per 1,000, of the birth-rate at 37 per 1,000, and of the death-rate at 30·7 per 1,000. The physiological increase of the population is therefore, on an average, 6·3 per 1,000.

With respect to these figures we should remark that while the birth-rate is very satisfactory, the death-rate seems excessive in a country whose climatic and productive conditions are so favourable. The explanation is to be found in the heavy infant mortality due to the indifference to hygienic rules which prevails amongst the lower classes. The remedying of this social evil is receiving the earnest attention of the Government and of philanthropists.

CHAPTER IX

COLONIAL PERIOD

THE Spanish *conquistadores* based their power on the royal charters which allocated the lands that should accrue to the crown, and the conquered regions at once became fiefs or seignories in accordance with the Spanish political system. Valdivia distributed the territory of Chile amongst his chief captains, allotting to each a proportion of the native inhabitants in conformity with the system of *encomiendas* then in vogue in the New World.

The institution of the *encomiendas* was merely a means of gaining possession of the territory and of subduing the native population. It enabled Valdivia and his successors to acquire the labour indispensable to the building of cities and forts, the working of mines and placers, and particularly the cultivation of the soil.

The Spanish soldiery, constantly occupied in warfare with the Indians, had no time to found important cities, and lived primitively enough in camps and villages of mud huts, though later on they built a few wretched little hamlets. But the

vitality and activity of the colony increased in proportion as the affairs of war permitted of the development of agriculture, and, thanks to the system of *encomiendas*, of the utilization of native labour.

Thus gradually were formed the farms and estates of the colony, which gave the Spaniards definite possession of the great longitudinal valley as far as the banks of the Bio-Bio, where by force of arms they held in check the warlike Araucanian tribes.

On these estates, as in the cities, Spanish and native blood began to intermingle, and soon a new and vigorous race was born, the race of the *mestizo*, which to-day forms the great majority of the inhabitants of the Republic.

The upper classes maintained more or less the purity of their European blood, and their descendants enjoyed an advantageous pre-eminence in society, while some of them received the further consideration due to the administrative functions which they discharged. Owing to the wars with the Araucanos, ship-loads of European soldiery were arriving in the colony, and while the population was augmented by their numbers the *encomiendas* benefited by the additional native labour which they forced into their service.

The creole Spanish, that is to say the white race without admixture of Indian blood, occupied second

place in the social hierarchy, but formed, by virtue of their industry and intelligence and their attachment to the country of their birth, the patrician class which secured the independence of the colony and organized the most prosperous Republic of South America.

The third social element was constituted by the *mestizos*, born of the intermingling of Spanish and Indian blood, to which class we have already referred.

Chile has never suffered to any appreciable extent from the negro and mulatto element which, in other countries, has been the germ of the rebellious and disorderly spirit that has caused so many revolutions and civil contentions.

The native, regarded by the law as an individual who needed protection and segregation, was in reality, during the colonial period, a member of a vanquished race, and as such was subjected to forced labour. His wages were heavily taxed, and in addition to the constant toil which was exacted from him he had to suffer the cruel treatment of his masters. The consequence was the gradual extinction of the Indian inhabitants.

The excesses and abuses committed against the natives towards the end of the eighteenth century aroused the humanitarian sentiments of the Governor of Chile, Don Ambrosio O'Higgins, who represented to the monarch the necessity of suppressing the

encomiendas then in existence, showing how the abolition of forced labour must bring as an immediate consequence the industrial and agricultural prosperity of the country. A royal Act of 1791 ordered the incorporation to the crown of all the *encomiendas* of Chile. By this time the number and importance of the Indian allotments had dwindled considerably, while the free and independent working-class had increased in extraordinary fashion. The fulfilment of the royal wishes, however, encountered some opposition from the usufructuaries of the system and contributed to the alienation of a part of the population from the maintenance of Spanish rule. As to the natives themselves, their ignorance prevented them from understanding that the king had given them their liberty, and they continued to slave for their masters under the designation of *inquilinos* ('tenants'), a name which is still accepted, without protest, by the free labourers who settle on a farm or estate to work for the proprietor.

The reforms accomplished during this period mark the dawn of a new era in Chilean history.

The colony now relied upon the original institutions for the formation of a people capable of self-government. For nearly three centuries the absolute authority of the Spanish monarchs had prevailed without let or hindrance; the king was arbiter and sovereign lord of the country, dictating his commands

under the sanction of his own laws and wielding unrestricted power. All appointments were held from the crown, and were conferred as a rule upon Spanish-born subjects who had friends at court. Seldom were they obtained by the *criollos* of the colony.

The fear of usurpation of power or of the exercise of undue influence, says an author, was the general cause of the insecurity of public offices or appointments. Not a single functionary, whether of the administrative, military, or even the judicial order, could feel his position assured, since all the appointments were for a limited period, terminable at will. Purchase by auction was the system by which nine-tenths of the public posts were obtained.

For the administration of the affairs of the Indies there existed a Supreme Council, which in the name of the king dictated the edicts, laws, and regulations considered suitable to the provinces.

By the end of the eighteenth century Spanish dominion extended from the southern frontiers of Perú to the banks of the Bio-Bio, and the territory was divided into thirteen provinces: Copiapó, Coquimbo, Quillota, Aconcagua, Melipilla, Santiago, Rancagua, Colchagua, Maule, Itata, Chillán, Puchacay, and Huiquilimu. The Spaniards also possessed the fortified town of Valdivia, the archipelago of Chiloé and the islands of Juan Fernandez.

The government of the country was invariably entrusted to a personage of high military rank, who assumed the title of Captain-General, Governor, and President of the Kingdom of Chile. His residence was in the city of Santiago, and he exercised his function subject to no authority but that of the monarch, save in the event of war, when he was obliged to consult with the Viceroy of Perú. In his quality of Captain-General he had under his command all the military forces and the heads of the garrisons of Chiloé, Valdivia, Valparaíso, and Juan Fernandez. As President he controlled the highest tribunal of Justice, the Royal Audience, or Chancery.

The provinces were governed by *Intendentes*, in theory appointed by the king, but, in view of the distance from Madrid, usually nominated by the governor.

In the province capitals a municipal corporation known as the Cabildo, composed of *alcaldes*, *regidores*, and other magistrates, administered local affairs.

In respect of the ecclesiastical government, the territory was divided into two vast dioceses, that of Santiago and that of Concepción, in the charge of suffragan bishops of the Archbishopric of Lima.

The system of taxation in vogue in the American Colonies followed no theoretical principle, and was designed solely to secure the greatest possible profit to the crown, without regard for the injury that the

imposts might occasion to the prosperity of the country and the welfare of its inhabitants. The principal revenues of the Treasury consisted of the customs house duties, the *diezmos* or tithes, the taxes on mining and agriculture, and the product of the sale of public offices and of Papal bulls.

It is probable that these revenues would have sufficed for the ordinary expenditure, but they failed to cover the heavy cost of the wars against the Araucanos.

Chile, at the period of the Independence, was in reality a military colony, which contributed no surplus to the Royal Treasury, and which, for its own support, had need of the endowment of 220,000 ducats which was voted by the 'Laws of India' and annually received from Lima.

The collection, management, and fiscalization of the revenue were entrusted to the presidents, *audiencias*, royal officials, and other administrative authorities.

The administrative system suffered from the spirit of mistrust which prevailed in the Spanish government, and which was the cause of a confusion of authorities and departments. It was responsible, too, for the appointment of commissioners, auditors, and paymasters of the royal offices in order that they might secretly and reciprocally keep watch upon one another.

Another of the marked peculiarities of the colonial

régime was the farming of revenues and the sale of public offices and appointments. Royal patronage extended not merely (as was natural) to the highest appointments, but also to the nomination and confirmation of even the pettiest of employees. These appointments, frequently entirely unsuitable, provoked the discontent of the colonists and caused no little embarrassment to public affairs.

The economical policy pursued by Spain in her relations with her South American possessions was the expression of the ideas of the time, and consisted of a combination of restrictions and prohibitions whose object was to assure to Madrid the commerce of India, to safeguard the navies of Spain from the attacks of enemies and pirates, and to hinder the agricultural and industrial competition of the colonies. This protectionist system, designed to revive the prosperity of Spain, failed completely by reason of her political decadence, the bankruptcy of her treasury, and the absolutism of her kings.

The manner in which the lands were apportioned and the organization of labour could not but retard the progress of industry. Vast estates were distributed among a handful of proprietors, who exploited them through *encomenderos* or factors. These, as a rule, were devoid of all agricultural experience and worked the properties by means of the forced labour of the Indians, who could not be expected to interest

themselves in the progress of agriculture. Moreover, the principles of legislation tended to perpetuate the conservation of the estates by means of entails, and in many cases restricted cultivation in order to protect the interests of agriculture in Spain.

The Spanish monopoly of exports, together with this system of restrictions and prohibitions, sufficiently explain the backward state of Chilean agriculture at the Independence period. Mining, on the other hand, had developed without obstruction for the reason that it was immensely to the interest of Spain that her colonies should furnish the greatest possible quantity of precious metals. Chile was thus able to occupy fourth place amongst all the countries of the world in respect of her production of gold, for the coining of which a mint was installed in Santiago towards the middle of the seventeenth century. This obviated the necessity of sending the metal to Lima, as was formerly prescribed by laws designed to favour the Lima merchants and the Lima mint.

The money thereafter coined in Chile was of the same stamp, weight, and carat as that of Castile.

The manufacturing industries enjoyed but a limited existence, for the reason that legal prohibitions and the generally backward state of the country opposed their development.

As to the commerce of the interior, the sale of merchandise was subject to taxation in respect of the

quality and price in each locality of the goods on sale, which also paid the excise duty.

Intercolonial commerce, when not prohibited altogether, was subject to import and export duties, though in Chile the export of wheat and flour was free.

Commerce with Spain could not be effected direct from Chile, but was carried on through the medium of Perú, and, as regards commerce with foreign countries, this was prohibited absolutely, under pain of confiscation and death.

These excessive restrictions underwent a remarkable transformation with the advent of the edict of free trade issued by Carlos III in 1778, but freights were so high that Chile profited very little by the change.

Such was the political, economical, and social condition of Chile when events in Spain, consequent upon the Napoleonic invasion, effected a notable alteration in the situation of the colony.

CHAPTER X

THE REPUBLIC

THE capture of Ferdinand VII aroused the patriotic sentiment of the Spaniards and incited the glorious war in which a whole people fought for its independence and sovereignty. In the name of the monarch a central Junta, representative of the entire nation, took over the government of Spain, and other Juntas were organized in the provinces for the administration of local affairs. In 1809 the Central Junta declared that the colonies were not dependencies of the crown but integral parts thereof, with rights equal to those of the Spanish provinces.

At this period the United States was already a powerful nation, and had proclaimed the right of independence as a part of American public right.

The ideas of the French philosophers of the eighteenth century had also pierced the dark clouds of ignorance in which the people lived. Chilean society included men who were capable of understanding and following the evolution of the new ideas, and thus it was that the Spanish people's cry for liberty could echo so loudly in that far-distant colony.

Noble spirits in Chile clearly perceived the defects of the Spanish *régime*, the unjustifiable preference enjoyed by the peninsular Spaniards in the distribution of public offices, and the evils of the restrictions and prohibitions which impeded the progress of civilization. They pitied the situation of a people sunken in the depths of ignorance, and deplored their lack of industrial and commercial activity; and of these sentiments were born aspirations towards a better government in which their ideas of reform could be made to prevail. This superior class of Chilean society was formed of the Spanish *criollos*, descendants of ancient families who had settled in the country, and some of the better-class foreigners who had known the benefits of a more advanced civilization. The peninsular Spanish population, composed of public employees, magistrates and high functionaries, and of the military forces and their families and relations, united by the bond of origin and cherishing the same ideals and sentiments, naturally resisted all innovation and fought with vigour and energy to maintain monarchical traditions and institutions.

As the masses were in no way prepared for the reception of the patriots' ideas, and as the opposition which the latter encountered was exceedingly strong and active, the struggle assumed from the beginning a coercive character.

The reform movement was supported by the Cabildo, the only colonial institution in which Chilean-born Spaniards held any preponderance. The deposition of the president, Don Antonio García Carrasco, and the creation, on September 18, 1810, of a national governing body elected by the Cabildo with the concurrence of the inhabitants of Santiago and the surrounding neighbourhood, were the initial acts of the movement towards independence which eight years later ended in the rout of the Spanish forces.

The governing body, or Junta, elected to rule the destinies of the country in the name and as representatives of the captive King Ferdinand VII, convened in 1811 the first National Congress, which proclaimed the liberty of commerce, abolished slavery, prohibited the introduction of slaves, and prepared other important reforms. In the following year Chile was given a Constitution in which principles of representative government were for the first time applied, and these principles were accentuated in the amended Constitution which soon followed. The war of the Spanish reconquest destroyed the results of these labours.

With resistance reorganized in Mendoza under the leadership of Generals San Martín and O'Higgins, Spanish power fell into decay, and after the battles of Chacabuco and Maipo (February 12, 1817, and

April 5, 1818) Chile was able to confirm her independence by dispatching her armies, in 1821, to liberate Perú.

On October 23, 1818, the Provisory Constitution was proclaimed in Chile, a Constitution which is considered to be one of the bases of her present form of government. The Constitutions of 1822 and 1823 perfected the political organization of the country, but as they did not satisfy the aspirations of the people they were replaced by other statutes in 1825 and 1828; these in turn gave place to the Constitution of 1833, which still prevails.

While in the constitutional statutes the surest means were sought, says one writer, of organizing the public powers and of constituting the country, the administrative and legislative acts manifested a no less decided intention to ameliorate the industrial situation. It was desired to embrace in the most extensive and comprehensive manner the varied field of the civil law's action; to settle in liberal and suitable fashion the status of individuals; to organize agriculture, industry, commerce, and transport; to keep a critical eye upon the public services and the general arrangement of the Treasury; to moderate the taxation as far as practicable, and thus to form a system as perfect as was possible in that period. The state of the country did not permit of any particularly drastic reforms. The Cortes of Cadiz

had abolished taxation of the Indians and the system of personal service known as *mita*, had conceded to the colonists liberty to cultivate whatever nature or the art of man might provide, and had ordained that Americans might occupy in Spain positions or appointments of any and every description. The statesmen of Chile followed the movement of reform by establishing the liberty of slaves and the freedom of the Press, and by opening primary schools and generally improving the condition of the natives, declaring them to be Chilean citizens, as free as all the other inhabitants. In 1813 the first national Government had decreed the establishment of free trade with the object of stimulating the development of commerce and the shipping industry, and in 1824 arrangements were made to facilitate the introduction of foreign immigrants and of new industries, and to assist the development of mining by suppressing the old taxes.

In the same way important improvements were effected in the public services, such as the creation of the superior Treasury offices, the suppression of the sale of appointments, the regulation of the imposts and the coining of the national money.

The cost of the emancipation of the country had made great demands on private fortunes and had necessitated sacrifices of all descriptions which for

some time embarrassed the progress of public administration. To this was to be added the lack of prudence amongst the political leaders and parties, which reduced the country to a state of disorder in which it was impossible to gather the fruits of the reforms initiated in the preceding years. It is therefore no matter for surprise that the public revenues showed but a trifling development, and that when the first balance of the national Treasury was struck in 1830 the result showed an average annual ingress of but \$1,736,000 for the previous five years.

After this epoch, and under the protection of the Constitution of 1833, commences the period of the real political and economical organization of Chile.

The Government of General Don Joaquin Prieto, supported by men of worth and experience such as Portales, Egana, Rengifo and Tocornal, initiated the reform of civil and administrative legislation, with the object of bringing it into harmony with the new constitutional institutions of the republic. In economic matters they adopted the principles of free trade and the first efforts were made to attract foreign commerce, to which end warehouses were established in Valparaiso, in 1833, for the gratuitous reception and warehousing of goods in transit. In this way commerce increased appreciably, and

the cost of living was lessened, in spite of the fact that as yet the country possessed no elements for the creation of industries of its own.

A great factor in the economic development of the country was the introduction by Mr. Wheelwright, a United States citizen, of steam navigation. With the assistance of the Government this was effected in 1840.

Even in the military events which occurred during the administration we are studying the magnitude of the results obtained in relation to the scantiness of the means available is matter for surprise. The country successfully conducted a foreign campaign for the destruction of the Perú-Bolivian confederation, which had been formed, says a historian, by the Dictator Andres Santa Cruz, and which was directed against Chile.

With the resources, ordinary and extraordinary, which the Treasury succeeded in acquiring, the sum of \$2,751,000 was obtained, which met all the necessities of the nation and still left for 1838 a surplus of a quarter of a million *pesos*.

General Prieto remained president until 1841, when he was succeeded by General Bulnes, under whose government the progressive development of democratic measures continued without interruption, and the way was cleared for the definitive organization of the public institutions. The Government

commenced seriously to attend to the education of the people with the object of preparing them for the national life, and for the first time individual action began to make itself felt. Attention was also drawn to the municipalities, whose working demanded co-ordination. During this period many important laws were enacted, dealing with elections, internal government, means of communication, statistics, weights and measures, immigration and colonization, administration of justice, elementary and university education, taxation of licences, coining of money, and the administration of the custom-houses, in such a way that in the laws, decrees and regulations which were then promulgated are found the germs of the greater number of the institutions which were developed later.

During the presidency of Don Manuel Montt (1851-61) the Civil Code was enacted, which has served as a model to most of the other Latin-American nations ; schemes were approved for the establishment of Chairs of Political Science, Law, Medicine, and Physical and Mathematical Sciences ; the professions of Civil Engineers, Geographers and Architects were created ; girls' schools were organized ; private libraries were founded, and through the medium of the law of elementary instruction of 1860 the principles of the preceding legislation were systematized.

The same period saw the completion of the scheme for colonizing the territories of Valdivia and Llanquihue.

To stimulate the development of agriculture the *Caja de Crédito Hipotecário* was created, on the lines of the French *Crédit Foncier*, and banking laws were passed which are in force to this day.

In the Treasury branch the customs-house service was improved and the old system of payment of taxation in kind, known as *diezmos* or tithes, was abolished and replaced by a territorial impost based on the income derived from the property.

Thanks to the impulse given to education, individual action, encouraged by a stable civil *régime*, became more general, leading to the expansion of industries and undertakings of all kinds. Exterior commerce increased; agriculture, with the employment of agricultural machinery, began to improve and extend, and the first banks of issue and discount banks were installed. The mining industry developed considerably, and manufactures came into being on a more definite basis. The establishment of railways and telegraph-lines contributed immensely to the diffusion of progress and served to stimulate production.

In the period which followed, commencing in 1861 with the presidency of Don José Joaquín Pérez, national institutions and legislation continued to

improve. The Commercial Code was enacted with various complementary regulations ; public education was extended and several reforms were effected in the administration of the national Treasury. The Araucanian campaign and the depredations of the Spanish fleet on the coasts of Chile in 1866 put to the proof the solidarity of the administration and the temperament of the public spirit. Following up the impulse which the previous Government had imparted to progress, the party then in power urged on the construction of railways and other public works.

President Errázuriz governed the country from September 18, 1871, to the same date in 1876. Until his term of office the Constitution of 1833 had permitted the re-election of presidents, so that Prieto, Bulnes, Montt, and Perez each governed for ten years. President Errázuriz, however, reformed the Constitution in his first year of office and remained in power for five years only, the period which obtains to this day. During his occupation of the presidency a great impulse was given to public works ; new railroads were constructed and the Congressional Palace and the Normal College of Agriculture were built. In the latter was held, for the first time in America, an International or rather a Universal Exhibition. During this period the Penal Code was enacted, together with the ' Code

of Organization and the Repartition of the Courts of Justice'. To the Government of President Errázuriz the country owes the increase in its naval power which enabled it, a few years later, to oppose the Peruvian squadron and to emerge triumphant from a war that was not of Chile's seeking.

The elections of 1876 resulted in favour of Don Aníbal Pinto, who governed the country until 1881. During his tenure of office Chile passed through a very trying and difficult period. The economic situation suffered considerably from the decadence of the silver and copper mines, which up to then had been the source of immense wealth and had formed the principal basis of exportation. A financial crisis supervened, the metal coinage disappeared from circulation, and the Treasury found it impossible to provide for the ordinary expenditure of the nation. The outcome of this situation was the establishment of a bank-note currency and, later, of paper-money. International complications imperilled the maintenance of peace with Argentina, as the discussion of the boundary question between the two nations had assumed a serious aspect.

In 1879 questions of another order that had arisen in connexion with Chile's relations with Bolivia obliged the Government to declare war against that republic and against Perú, with which country

she was secretly allied, Perú, indeed, being the instigator of the difficulties. Making a strong effort, Chile succeeded in conquering the allied forces and, carrying the war into the enemy's country, she occupied Lima, the Peruvian capital, not, as in 1821 and 1839, to liberate Perú from her tyrants, but to ensure for Chile the peace under whose shelter she has gained all her liberties, her most progressive institutions, and the name and credit which she enjoys.

A country possessed of such energy should give proofs of her capacity for progress, and in 1884, with the war barely at an end, Chile made haste to celebrate its conclusion by means of a memorable National Exhibition, which marked the point of departure of a new development of her productive powers.

From 1881 to 1886 the government of the country was entrusted to President Domingo Santo-Maria, to whom it fell to terminate the war in the manner to which we have referred. The conclusion of peace brought Chile the rich Tarapacá territory, while the recovery of lands in the occupation of Bolivia permitted of the uninterrupted extension of her territory to beyond the eighteenth parallel of latitude south and of the expansion of commerce and industrial activity over a vast zone. The pacification of all the Araucanian tribes rendered an extensive

region in the south available for agricultural exploitation, and to hasten the peopling and the civilization of this large tract foreign colonies were founded and railroads were constructed to put it into communication with the rest of the republic.

On September 18, 1886, commenced the presidency of Balmaceda, characterized by great activity in the direction of public works and especially in the construction of schools and railroads. Unfortunately this progress was abruptly arrested upon the termination of President Balmaceda's administration by the struggle which began between the Executive Power and Congress, and which, in 1891, plunged the country into civil war. Upon the defeat of the Government forces the parliamentary authorities summoned the people to elect their president, and the choice fell upon Admiral Jorge Montt, whose task consisted principally of fostering the progress of the country and of soothing the antagonisms of the past struggle by means of a government which respected the rights of all. During his term various measures were introduced for the redemption of the emissions of paper-money and the re-establishment of the coinage, but circumstances were not favourable, and the conversion attempted in 1895 failed in 1898, when the country returned to the *régime* of paper currency.

On September 18, 1896, began the presidency of

Don Federico Errázuriz, who retained office until 1901. During this period, and throughout the term of office of his successor President Riesco, the boundary dispute with Argentina was one of the matters which most absorbed the interest of the governing bodies and of the whole nation. By a fortunate agreement between the Governments of the two countries the controversy, which had frequently menaced the maintenance of international peace, was submitted to the arbitration of King Edward VII, whose award, issued in 1902, put an end to the differences of the sister republics.

In 1906 the Presidency was entrusted to Don Pedro Montt, who continued in office until the state of his health obliged him to relinquish it. In 1910 he left on a voyage to Europe, where, upon his arrival in Germany, he died, in August of the same year. Gifted with extraordinary energy and imbued with patriotism, President Montt infused into his administration an activity which the country will be better able to appreciate some years hence. The construction of railways and public buildings, the improvement in the sanitary conditions of the towns, the creation of schools and establishments of general and professional education, the reform of many of the public services, and the high level at which all the institutions were maintained, are, amongst others, the characteristics of the Government of 1910,

the year in which the republic celebrated the first Centenary of its Independence.

We have refrained from speaking at greater length of the progress of the country during recent Governments, as we propose to describe in special chapters the stages of development attained by the various branches of national activity.

CHAPTER XI

THE CITIES

OF the 3,249,279 inhabitants of Chile about 43 per cent., or 1,407,908, live in groups of more than a thousand individuals. The remainder live on the sites of farming, mining and other operations, and in small rural villages. The proportion of the urban population to the total was 29 per cent. in 1865 and 34 per cent. in 1885, figures which clearly indicate the tendency towards concentration in cities.

There are 2 cities of more than 100,000 inhabitants, 6 of more than 20,000, 41 of more than 5,000, and 170 towns of more than 1,000. Of rural hamlets there are 4,884.

In 1885 there existed 2 cities of more than 100,000 inhabitants, 3 of more than 20,000, 28 of more than 5,000, 170 townships of more than 1,000, and 435 villages.

The principal cities, which are at present capitals of the various provinces into which the territory is divided, and their populations according to the last census, are shown in the following table :—

NORTHERN REGION

Tacna	.	.	.	.	9,176
Iquique	.	.	.	.	40,170 1
Antofagasta	.	.	.	.	32,496 1
Copiapó	.	.	.	.	10,287
La Serena	.	.	.	.	15,996 10

Other important cities are Pisagua, Tocopilla, Taltal, Vallenar, Coquimbo, and Ovalle.

CENTRAL REGION

San Felipe	.	.	.	.	10,426
Valparaiso	.	.	.	.	162,447 1
Santiago	.	.	.	.	332,724 1
Rancagua	.	.	.	.	10,380
San Fernando	.	.	.	.	9,240
Curicó	.	.	.	.	17,573 4
Talca	.	.	.	.	38,040 2
Linares	.	.	.	.	11,122
Cauquenes	.	.	.	.	9,683
Chillán	.	.	.	.	34,269 6
Concepción	.	.	.	.	55,330 2
Lebu	.	.	.	.	2,687
Los Angeles	.	.	.	.	11,691
Angol	.	.	.	.	7,390
Temuco	.	.	.	.	16,037 3

This enumeration of the cities which are heads of their respective provinces merely gives an idea of their relative importance, and it should be remembered that there are other cities of still greater importance than some of those we have named, such as, for instance, Los Andes, Quillota, Limache,

San Bernardo, Rengo, Parral, San Carlos, Mulchen, Traiguen, and Victoria.

SOUTHERN REGION

Valdivia	.	.	.	.	15,229	11
Puerto Montt	.	.	.	.	5,408	
Ancud	.	.	.	.	3,424	
Punta Arenas	.	.	.	.	12,199	17

Other cities of importance are La Unión and Osorno.

The city of Tacna and the port of Arica constitute the first important nucleus of population to be found in the northern provinces. The first-named is situated in a fertile valley from which it derives resources of every description, and it is linked by a railroad, 39 miles in length, with the port of Arica. The latter is situated at the outlet of the Azapa valley, at 18° 21' latitude south, and lies 928 miles from Valparaiso. The port has a commodious and sheltered anchorage, and its commerce, owing to the construction of the railroad to La Paz, the capital of Bolivia, is beginning to develop.

The most important city of the northern region is the port of Iquique, which is situated at 20° 12' latitude south, at a distance of 817 miles from Valparaiso. The bay affords good anchorage and the town is spread over a broad foreshore. The buildings are of unsubstantial construction and the streets are very broad and spacious.

This city is the most important centre of the nitrate industry and its trade is particularly active. It is linked by railroad with the nitrate works of the interior, and as a port possesses numerous wharves and other facilities for the lading and unlading of cargo.

Next in importance to Iquique comes Antofagasta, situated at $23^{\circ} 28'$ south. Its roadstead is fairly well sheltered towards the north but is quite open to the south, and as a result the heavy surf which is almost a permanent feature of the harbour greatly impedes the traffic. Antofagasta is 217 miles from Iquique and 600 from Valparaiso.

The city lies at the foot of lofty hills, entirely bare of vegetation. Its principal trade consists of the importation of general goods and the exportation of nitrate and borax. It is also a port of transit into the neighbouring republic of Bolivia. The international railroad which runs between La Paz and Antofagasta also assists the exploitation of the rich and extensive mining and nitrate zone of the province.

The city of Copiapó, capital of the province of Atacama, stands on the north bank of the river Atacama. It possesses some fine private and public buildings and numerous educational establishments, among which is a Practical School of Mining, which boasts a valuable mineralogical collection. The city is connected with the port of Caldera by

a railroad 50 miles in length. The port has a sheltered harbour and is 393 miles from Valparaiso.

The capital of the province of Coquimbo is the beautiful city of La Serena, which stands on the southern bank of the river Coquimbo, raised on a low table-land which dominates the bay of Coquimbo, 8 miles distant. It is connected with the port of Coquimbo by a line that forms part of the great Longitudinal Railway which traverses the country from north to south.

This port, whose geographical situation is $29^{\circ} 57'$ latitude south, possesses a fine roadstead, very broad and commodious. Its distance from Valparaiso is 197 miles. The town lies at the foot of the eminences which form Pelican Point ; it is an important centre of commerce and an outlet for the mineral and agricultural products of the province.

To the central region belongs the most important city of Chile—Santiago, capital of the republic, founded in 1541 by Don Pedro de Valdivia. It is situated towards the centre of a broad and fertile plain traversed by the river Mapocho, and, as has been said, stands 1,820 feet above sea-level. In the centre of the city, on the south bank of the Mapocho, rises a small hill, the Cerro Santa Lucía, anciently known by the natives as *Huelén*, a word which signifies 'pain'. From its summit the city can be seen in panorama, bounded on the east by the

Cordillera de los Andes, whose peaks in winter are covered with snow. The little river Mapocho, which runs through the city in a bed of rubble masonry, divides it into two districts, north and south. From the Cerro Santa Lucía westwards the avenue named Alameda de las Delicias in its turn divides the south district into two sections, cutting it at a sharp angle with the course of the river. To the north the hills Navia, Blanco, and San Cristóbal set a limit to the city.

The general plan of Santiago is very regular, and for the most part the streets are straight and broad. The district south of the Alameda covers an approximate length of a mile and three-quarters, and north of the Mapocho the precincts of the city extend for over a mile and a half. The angle formed by the river and the Alameda contains the commercial part of Santiago. The growth of the population has during recent years considerably extended the urban district so that it has the proportions of a great metropolis.

The Alameda, the Cousiño Park, the Normal College of Agriculture, the Santa Lucía hill, and the Parque Forestal with its various plazas and gardens are popular resorts which help to maintain the salubrity of the city while adding greatly to its beauty.

The public buildings, the private mansions, the monuments erected to Chile's illustrious men, the

churches and the theatres are all in point of architecture and proportions worthy of Santiago and of the republic. The Palacio de la Moneda, the residence of the president of the republic and containing the offices of the ministers of State, is an edifice notable both on account of its dimensions and for its age. The Congressional Palace, the Municipal Theatre, the Museum, and the Palace of Fine Arts are all worthy of mention, and the University, the Library, the School of Medicine, the State Prison, the Military School, and the Ministry of Industry and Public Works are structures of equal importance.

The Archbishop's Palace is a splendid building, and the Cathedral is one of the finest churches in South America. As to private edifices, there has lately been a revival of construction, and some of the factories and industrial concerns are housed in very costly premises.

Santiago is the seat of the Public Authorities, which are represented by the President of the Republic, the National Congress, and the Courts of Justice. It is also the head-quarters of the General Staff of the Army, whose most important buildings are the Academy of War, the Military School, the Arsenal, and the Ammunition Factory.

The water supply is brought from the Cordillera by means of pipes, and a sewerage system ensures the hygiene of the city.

Social and commercial movement is represented by a great number of institutions, many of which are maintained by the foreign colonies. There are many important banks, insurance companies, and commercial, agricultural, manufacturing, mining, irrigation, and transport concerns.

A service of electric trams facilitates communication within the urban radius, and there are others which run out to the suburbs. The central system of the State Railways puts Santiago into direct communication with all the principal cities of the central and southern regions, and before long the cities of the north will also be reached by the railroad.

At a distance from Santiago of 115 miles lies Valparaiso, the chief port of Chile and of all the west coast of South America. Its harbour is spacious but lies open to the north-west winds, which blow fiercely throughout the winter. Its geographical situation is 33° latitude south.

The city occupies a narrow strip of level ground and the slopes and uplands of the hills which surround the harbour. The alluvions and mud-flats which have formed on the foreshore have wrought a transformation in the bay, reducing the sheltered anchorage considerably, and the necessities of commerce have rendered peremptory the construction of a port with modern conveniences for traffic. The works, which will soon be contracted for, are to consist of

breakwaters and mooring-stages. At present the port possesses various floating wharves, of which the most important is the fiscal wharf, a work of some technical ingenuity. It is provided with the necessary lading and unlading machinery, worked by hydraulic power, and vessels of any draught can come alongside.

The machinery for the transport of merchandise from and to the custom-house is also hydraulically worked. The bonded warehouses of the custom-house are spacious and well-built structures.

For the repairing of vessels there are two floating-docks owned by a private concern.

As regards its architecture it is painful to record that a great part of Valparaiso was destroyed by the earthquake of 1906, when within a few short moments palaces and houses and, what is still more regrettable, two thousand of its inhabitants, disappeared. Since then the reconstruction of the city has proceeded apace, and the new Valparaiso will be better planned in every respect.

As is natural in a populous city, and in the principal commercial centre of the country, all the necessities of life and commerce are to be found in Valparaiso. The town can boast large and valuable buildings, public and private, and there are many social institutions, factories, banks, and shipping companies. Among the most important industrial establishments

in Valparaiso and its vicinity should be mentioned the factories of the Sociedad de Maestranzas and of Balfour, Lyon & Co., who undertake the construction of machinery of all kinds.

Valparaiso has many public educational and charitable establishments and other institutions. The water-supply is worthy of attention, for Valparaiso was one of the first cities in South America to use iron pipes for this purpose. Of recent years the supply has been perfected by means of the construction of an immense dam on the Peñuelas plain, which collects the rain-water from a hydrographic basin with an area of 22 acres. The water is led by an aqueduct to two distribution-tanks, 12½ miles from Peñuelas and nearly 1,200 feet above sea-level. From these two tanks the main pipes, capable of providing for a daily consumption of 14½ million gallons, carry the water into the city.

Another important feature of Valparaiso is the drainage of the city, which was carried out on the 'separate' system twenty-five years ago, by a company formed in England with a capital of £100,000.

There are electric trams in the level part of Valparaiso and a service of lifts which facilitates communication between the lower levels and the hills.

Valparaiso is the seat of the superior authority of the provinces, the Superintendent of Custom Houses,

the Director-General of the Fleet, the Naval School, and the principal officials connected with military-marine and navigation affairs.

To the north of the provinces of Santiago and Valparaiso is the province of Aconcagua, renowned for its agricultural wealth, whose capital is the fine city of San Felipe. It is 72 miles by railroad from Valparaiso, and at an equal distance towards the Cordillera is the city of Santa Rosa de los Andes, the point of departure of the Transandine Railway which unites Chile with the Argentine Republic.

Concepción comes third in importance among the cities of Chile and together with the port of Talcahuano forms a centre of civilization and commercial activity similar, though on a smaller scale, to those which are represented by Santiago and Valparaiso further north. Concepción is situated in the Mocha Valley, on the right bank of the Bio-Bio, and is 413 miles from Santiago. Its streets, buildings, and public services place it on a level with the modern cities of the same proportions. The port of Talcahuano lies at a distance of 9 miles from Concepción in latitude 36° south, in a broad bay in which there are various small ports. It possesses a sheltered anchorage towards the south-west, and at its entrance is the island Quiriquina, which to some extent protects the bay from the north winds. Talcahuano is 240 miles from Valparaiso.

Since the agricultural exploitation of the ancient Araucanian territory and the construction of railroads therein, Talcahuano has acquired considerable importance and now has a population of 18,000 inhabitants. The development of trade in the agricultural region, which comprises the provinces of Concepción, ~~Bio-Bio~~ and ~~Malleco~~, has reminded the authorities of the necessity of profiting by the advantageous conditions of the bay of Talcahuano to create a modern commercial port, and to this end important works are in progress. A military station is also being constructed to complete the works which were commenced there with the object of securing in the south of the country a base of operations for the navy.

Between Concepción and Santiago there are two important cities, Talca and Chillán. The first, the capital of the province of the same name, is situated on the left bank of the river Claro, at an altitude of 240 feet above sea-level. It possesses some fine buildings and many factories and commercial houses. It is 153 miles from Santiago and 56 from the river-port of Constitución, to which it is linked by a railroad. This port is situated on the south bank of the river Maule, one of the most important navigable rivers in Chile, at a distance of a mile and a quarter from its mouth, and it has 8,900 inhabitants.

The city of Chillán, capital of the province of Ñuble, lies between the rivers Ñuble and Chillán,

from each of which it is distant approximately $3\frac{1}{4}$ miles. It is the centre of a great industrial and agricultural trade, and an important fair is held there every Saturday. It is 245 miles distant from Santiago.

In the southern region is the city and river port of Valdivia, historically celebrated for the military importance of the fortifications which defended the river mouth and which were attacked and taken by Lord Cochrane when fighting in the service of Chile against the Spaniards. Valdivia lies at a distance of 11 miles from the sea and is the centre of important industries. The network of navigable routes which connects it with the river Valdivia also facilitates communication with the inland towns, while the Longitudinal Railway puts Valdivia in connexion with the rest of the republic.

In the Straits of Magallanes is the principal city of the Antarctic region of the continent. It is the free port of Punta Arenas, situated on the eastern coast of the Brunswick Peninsula. Cattle-rearing, fishing, and gold washing are its principal industries, and its geographical position renders it a centre of considerable commercial activity.

CHAPTER XII

COLONIZATION AND IMMIGRATION

THE mere physiological increase of the population, even under the best possible conditions, is insufficient for a country like Chile, which is beginning to exploit its sources of wealth ; it can neither provide the labour needed for its growing industries nor people the uninhabited public lands. The development of the mining and nitrate concerns of the north is the cause of a continued exodus of the inhabitants of the central region—the most populous—and hampers the progress of agriculture and the other industries of this part of the territory. The problem of the increase of the population has thus become one of much moment, and the successive Governments of the republic have made constant efforts to solve it. If the results have not been all that could be desired it has been for reasons which are easily explained.

Chile, a land of order and progress, gifted with a beneficent climate and choice and abundant natural products, a country where rights and liberty are perfectly secure, has been unable to attract spontaneous currents of immigration by reason of its peculiar

geographical situation—its great distance from Europe. It is common knowledge that the European emigrant prefers to settle in the countries nearest at hand, in the first place because the voyage, being shorter, is less expensive, and secondly because these countries are usually more familiar to him—he has heard more about them, probably from friends ~~or relations, who encourage him and help him to~~ emigrate. Chile, unfortunately, is not one of these countries. Distant thirty or forty days' steaming from Europe, it will surmount the strong barrier set up by distance only when it is brought nearer to the emigrants' countries by the improvement of transport facilities and by new means of communication, amongst which the Transandine Railway to Buenos Aires has already commenced to exercise a favourable influence, while the Panamá Canal will soon do the same on a vaster scale.

It is worthy of record that one of the first acts of the free Government organized by the Supreme Director, Don Bernardo O'Higgins, was to instruct the Plenipotentiary accredited to the Court of St. James's to promote immigration, Irish and Swiss in particular, into the republic, and this though the Government was preoccupied with the war of 1817. Many subsequent acts testify to the interest with which Chile's rulers regarded this problem, whereof no practical solution was forthcoming until a number

of years later. In 1845 the first laws as to colonization were dictated ; towards the end of 1848 Don Bertardo Philippi was nominated agent of immigration in Germany, and about the middle of 1850 the first colonists began to arrive at Valdivia, which was ~~the place selected~~ for establishing the basis of colonization. The centres of ~~population which these~~ colonists formed in the provinces of Valdivia and Llanquihue were sufficient to effect, within a few years, a total transformation of the conditions of these extensive districts.

Before the arrival of the German colonists the township founded by the *conquistador* Don Pedro de Valdivia was in a very backward state ; industries it had none, and its trade was practically non-existent. In ten years remarkable progress was made ; agriculture and cattle-raising developed, factories came into being, interior and exterior commerce improved, and even nature dropped her forbidding mask and showed herself hospitable and kindly.

The whole region between the river Valdivia and the Gulf of Reloncaví benefited by the favourable influence of this colonization, and the towns and cities which have prospered therein are distinguished by the advanced state of their industries and by the activity of their commerce. Valdivia, La Unión, Osorno, and Puerto Montt are the most important

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centres, and after these come the industrious colonies of Trumag, on the river Bueno, and of Puerto Varas and Octay on the shores of Lake Llanquihue.

The second attempt to colonize State lands was an undertaking of a more ambitious nature. The brave Araucanian tribes, after the emancipation of the country from the crown of Spain, retained the territory which they had possessed in the colonial period. This was the territory between the rivers Bio-Bio and Tolten, extending from the sea to the Andes Cordillera. Northwards the frontier line was defended by a series of forts occupied by military detachments. The constant depredations of the Indians induced the Government of President Perez to commence the pacification of Araucania, and the frontier line was pushed southwards to the shores of the Malleco, various townships being founded on land won from the savages during the years 1861 to 1869. Yet total conquest could not be achieved, and to this end new forts were constructed thirty miles from the river Cautín. Settlers began to arrive and little by little the natives adopted a civilized life. After a rising which was easily subdued, the Government of President Santa Maria accomplished the complete pacification of the Araucanian territory in 1883, occupying the city of Villarrica, which marked the southern limit of the region that the native tribes had possessed for centuries. With-

out loss of time this territory was set apart for foreign colonization, and railways were constructed in order that it might be infused with the spirit of civilization. By means of government agents, French, Swiss, German, and Basque colonists were secured, and with them were founded the agricultural colonies of Victoria, Quechereguas, Quillen, Ercilla, Traiguen, Contulmo, Quino, Temuco, Lautaro, Galvarino, Puren, and Imperial. To-day it may be said that these colonies have been incorporated into the community and have ceased to be official institutions.

The task begun by President Santa Maria and continued by President Balmaceda in Araucanian territory had as its principal object the handing over of the region to private individuals for exploitation, and with this end in view vast tracts of land, which now form valuable agricultural properties, were sold to the highest bidder. The lands have appreciated in value, the population has increased, trade has grown, and to-day the provinces of Malleco and Cautín, which compose the ancient Araucanian territory, are amongst the most productive districts of the country in point of cultivation, cattle-raising, and timber-working.

The Government of Admiral Montt having decided to establish colonial centres in the public lands of the Island of Chiloé and on the river Maullin in the Llanquihue Province, the colonies of Chacao,

Huillinco, Mechaico, Quetalmahue, Queilen, Quellon, and Rio Gato were founded. This undertaking has met with some difficulties, but the region lends itself admirably to the development of thriving townships. The climate is mild, temperate, and uniform, land is cheap, and the facilities for sea and river communication may without difficulty be perfected. The labourer, too, is steady and sober, and wages are low. Although the cultivation of cereals is less remunerative than in the central provinces, they are produced in sufficient quantity for consumption, and the yield could easily be increased. Pasture-lands abound, and forage-roots can be grown with excellent results, so that the cattle-raising industry has wide scope for development. Flax and fruit trees thrive, and the forests yield timber of the best description for the construction of houses and vessels, some of the species being also used, throughout the country, for sleepers on the railroads. But the most characteristic product of Chiloé is the potato, which is considered a native of the region, and of which many varieties—more than a hundred, according to some authorities—are known. Potatoes are sown in dry soil twice a year and yield from fifteen to twenty tubers apiece. Fishing is another industry which provides abundant food for the population of the islands of the archipelago. The fish swarm in these waters to such an extent that they are caught in *corrales*, low circular

walls of stone built on the shore, in which, when the tide recedes, the fish are imprisoned. Valuable oyster-beds exist everywhere in the Gulf of Ancud. In short, the natural conditions of Chiloé are distinctly favourable for colonization, and may with advantage be compared with those offered by the English Channel Islands or the coasts of Normandy and Brittany.

In 1843 the schooner *Ancud* of the Chilean navy, commanded by Captain Don Juan Williams Rebolledo, set sail for the Straits of Magallanes, and there, by order of President Bulnes, founded a fortified place with the object of assisting navigators and of civilizing a region until then deserted. Later on, President Montt founded, on a site now occupied by the city of Punta Arenas, an agricultural colony which in 1877 commenced to develop the sheep-rearing industry, introduced from the Falkland or Malvinas Islands. The sheep multiplied extraordinarily and the population of Punta Arenas grew with the prosperity of the industry. Until 1889, nevertheless, it was but a small village with little more than 1,500 inhabitants.

The principal industry of Magallanes is cattle-raising and especially sheep-rearing. Statistics show the existence of 2,000,000 head of sheep, 50,000 horned cattle and 35,000 horses. There are also several refrigerating establishments for the export of

frozen lamb, and amongst them the South American Export Syndicate (Ltd.) and the Refrigerating Company of Patagonia can prepare and ship 150,000 to 200,000 carcasses a year. The Tierra del Fuego Development Company is the most important of the sheep-rearing concerns.

The working of coal deposits and of gold placers is another possible source of wealth to the Magallanes territory.

Apart from the official or government colonies of which we have spoken, a number of private colonies have been established by means of contracts for the concession of lands made by the Government with certain colonizing concerns, amongst which the New Italy colony is the most important. This colony was founded in the province of Malleco, and to-day forms a very flourishing agricultural centre.

With the idea of attracting back to the country the large number of Chilean citizens who, in the course of years, had settled in the neighbouring Argentine valleys and territories of the south, the Government decided to form national colonies by offering lands and other benefits, and in a short time created ten colonial centres in about 100,000 acres, whereon over three thousand souls settled permanently.

At the same time as the work of official and private

colonization was proceeding, the Government made efforts to civilize the natives and to reform their communistic habits by marking out the lands they should occupy.

To appreciate as a whole the activity of the State in the matter of colonization it will be sufficient to quote particulars of the lands which have been surveyed and measured up to the present, and of the manner in which they have been distributed. In the provinces of Malleco, Cautín, Valdivia, Llanquihue, Chiloé, and Magallanes, 1,080,000 acres have been devoted to colonization, 6,772,500 acres have been sold, and 50,000,000 acres have been chiefly conceded to private undertakings in the three last-named provinces. In addition, 625,000 acres have been set apart for natives. In the colonized lands there are 37 colonial agricultural centres, national and foreign.

The laws in force permit the Government to concede to the colonists brought out by their agents a certain extent of territory for each head of the family and for each son over ten years of age, together with pecuniary assistance and many other benefits. The Government may also sell lands in public auction in lots not exceeding 1,250 acres, with facilities as to payment therefor.

Without reckoning the immigrants who have settled in the agricultural colonies, a certain number of persons have entered the country as free or

industrial immigrants, to whom the State has granted the whole or part of their passage from Europe. These immigrants are recruited by the Government agents, or come at the instance of industrials who engage them for their own account, or are encouraged to come by relatives already established in the country. In this way some 50,000 individuals have entered the country.

It is very difficult to calculate even approximately the area of the public lands available for sale or colonization, for the reason that their measurement is not yet completed; but according to existing statistics the level lands suitable for agriculture or cattle-raising already explored between parallels 41° and 56° exceed in extent 18,125,000 acres. It is estimated that on the explored lands south of parallel 52° , that is to say the region north of Magallanes, the Brunswick Peninsula, Dawson Island, and the northern part of Tierra del Fuego, there is space for 7 or 8 million head of sheep or horned cattle.

CHAPTER XIII

MEANS OF COMMUNICATION

A COMPLETE revolution in the system of land transport was brought about by the construction of the first railroad, accomplished in 1851 by the illustrious North American citizen, Mr. William Wheelright, whose name is connected with the most important industrial undertakings of the middle of the past century. From that time onwards the facilities for communication by railroad have improved without interruption in proportion with the necessities of the country and the means available. The first railroads were naturally built in those regions where production was more active, but it was not long before others followed, giving access to the natural resources of the whole country, and introducing into every region the benefits of expeditious and easy communication.

It is to be remarked that while a great part of the work accomplished is due to private enterprise much must be credited to the State, which, in the last thirty years, has made a national policy of the construction and working of railways on a large scale.

After examining as a whole the network of railroads which facilitates communication in each of the industrial regions of the country, we will study the statistics of the private and state railroads.

In the northern provinces the principal lines are those of the nitrate region in Tarapacá and Antofagasta.

The most important railway of Tarapacá is the Iquique-Pisagua line, constructed to serve the nitrate industry. It is composed of one main line and eighty-eight secondary branches to the *oficinas* where the nitrate is worked. Its total mileage is 325 miles and its value amounts to £4,000,000. It is owned by the Nitrate Railways Company. With this line is connected that which runs from Junín to the Carolina *oficina*, covering, with its branch lines, a length of 56 miles. It belongs to the Junín Nitrate Company, and its value is £260,000.

Between Caleta Buena and Agua Santa there is a railroad 64 miles in length serving the nitrate workings of the district. Its value is £463,000.

Between the Granjas station of the railroad to Lagunas and Cerro Gordo and the mines of Chayacollo there is a line 22 miles in length which belongs exclusively to a mining company.

In the province of Antofagasta are: the railroad from Tocopilla to the Toco nitrate beds, with a

length of 76 miles and a value of £650,000; the Antofagasta-Bolivia Railway, 715 miles in length, with branches to Collahuasi and Boquete totalling 83 miles; the line from Caleta Coloso to Aguas Blancas with 116 miles, and the branches to various *oficinas*, which total 24 miles.

The Chilean section of the Antofagasta and Bolivia Railway runs between Antofagasta and Ollagüe over a distance of 274 miles. Including several branch lines the total mileage of this section amounts to 497 miles. It belongs to an English company, the Antofagasta (Chile) and Bolivia Railway Company, originally floated with a capital of £2,150,000. Its present capital is £8,550,000.

The railway from Caleta Coloso and its branch lines has a value of £950,000.

The line from Taltal to Cachinal de la Sierra is 92 miles in length, and its different branches have an equal mileage, which gives a total of 184 miles. Its value is over one million sterling.

In the mining zone, which extends from the province of Atacama to that of Coquimbo, there are several railways of importance. The line from Chañaral to Pueblo Hundido has a length of 90 miles, and its branch from Inca to Chule a further 54 miles. The railroad from Caldera to Copiapó was the first to be constructed in Chile, and for this reason deserves that its origin should be known. It was due, as we

have said, to Wheelright, who, after having introduced steam-navigation on the coasts of Chile in 1840, began the construction of the line in March, 1850, with a capital of \$800,000, subscribed almost entirely by Chilean citizens, and completed it in December of the following year. The line had a length of only 50 miles, and in subsequent years additions were built, at a cost of \$4,240,000, until a total of 150 miles was attained. This railroad has several branch lines of minor importance.

In the same Atacama province and a little to the south of Caldera is the line from Carrizal to Yerba Buena, which serves an important mining region and, with its branches, has a length of 115 miles.

From the port of Huasco there is a line which reaches the city of Vallenar after traversing 31 miles.

In the province of Coquimbo there are three railways: the Coquimbo-Ovalle line, 73 miles; the Serena-Rivadavia line, 50 miles; and the line from Tongoy to Trapiche, with 37 miles. Their combined mileage is therefore 160 miles. The lines from Chañaral, Huasco, and Coquimbo are owned by the State.

From the province of Aconcagua southwards runs the central railway system of Chile, belonging to the State. It traverses the whole territory as far as the

Gulf of Reloncaví, and is divided into four sections, as follows :—

1. Valparaiso to Santiago and branches to Los Andes and Cabildo ; and the Vilos-Illapel section. Total, 202 miles.
2. Santiago to Talca and branches to San Antonio, Pelequen to Las Cabras, San Fernando to Cardonal, Talca to Constitución and San Clemente. Total, 366 miles.
3. Talca to Victoria, San Rosendo to Talcahuano and branches from Parral to Cauquenes, Santa Fe to Los Angeles, Coihue to Mulchen, Renaico to Traiguen, &c. Total, 416 miles.
4. Victoria to Osorno and branches, with a total of 272 miles. The section between Osorno and Puerto Montt is practically completed.

In all, the central system of the State railways has a mileage of 1,256 miles.

Apart from this railway system there are several privately owned railroads in the central region. The line from Santiago to Pirque has a length of 14 miles ; the line from Rancagua to Teniente, in the province of O'Higgins, has a mileage of 58 miles, and belongs to the Braden Copper Co. Other lines are : Concepción to Penco and Lirquen, $10\frac{1}{2}$ miles ; Concepción to Curanilahue, in the coal region, which has a mileage, with its several branches, of 64 miles ; Monte Aguila to Trupan, in the province of Concep-

ción, 38 miles ; Collielfu to Lake Rinihue, 44 miles, and, in Magallanes, the short line of 5 miles from Punta Arenas to Loreto.

Recapitulating the foregoing details, we find that the railway system of Chile consists of 3,384 miles of line, of which 1,583 are of privately owned railroads and 1,801 of lines belonging to the State.

There are no statistics by which we may estimate the total value and the movement of passengers and freight of the private railways. As to the State lines, the most recent calculations assign them a value of £13,286,140, a freight-movement of 4,300,000 tons, and a passenger-movement of 10,643,000.

There are two international railways, that of Antofagasta to Bolivia, to which we have already referred, and that of Los Andes to the Argentine Republic. Next year will see the completion of a third international railroad, which the State is constructing between the port of Arica and La Paz, the capital of Bolivia.

The line from Los Andes to the Argentine frontier has a length of 43 miles, and was constructed by an English company which was guaranteed an interest of 5 per cent. on a capital of £1,500,000. From the Argentine frontier to Mendoza there is a privately owned line which connects with the railway system of Buenos Aires.

The railway from Arica to La Paz has a length of

286 miles, and its construction was undertaken by the English firm Sir John Jackson (Chile) Ltd., for the sum of £2,750,000.

To complete the railway system at present in operation, and to facilitate transport in productive regions which for the time being are isolated and suffer from the disadvantages of costly and difficult communication, the State has commenced the construction of numerous branch lines on the central system, and is approaching the solution of the problem of extending this system to the northern region of the country by means of a line which shall serve to connect the isolated railways in the nitrate and mining districts with the rest of the republic. It is this idea, at once politic and economical, that is now being put into execution by means of contracts with two English companies. One of these, the Chilean Longitudinal Railway Construction Company, will build an extension 426 miles in length, between Pueblo Hundido (on the Chañaral line) and Lagunas (on the Iquique line). The other, the Howard Syndicate, will construct 371 miles of railway to complete the line which is to link the station of Cabildo, in the province of Aconcagua, with Toledo, in Copiapó. These contracts involve an outlay of £7,000,000.

Of the branch lines of the central system at present under construction, some run towards the

Andes Cordillera to communicate with the Argentine Republic, while others—the more important—are designed to provide an outlet to the coast for the products of the interior. Of these, the principal is that of Chillán to Tome, in Talcahuano Bay, which will have a length of 58 miles.

In the present year (1911) the railroads from Arica to La Paz, Cabildo to La Serena, and Osorno to Puerto Montt will be inaugurated.

The total mileage of the railroads ~~under~~ construction for the State is 1,550 miles, and the cost of these amounts to £12,310,833. There is a further total of 930 miles projected, of which about 300 have been sufficiently studied to determine their construction.

Seeing that the railways are merely the great arteries of circulation, it is very necessary, while the lines of local interest are being developed, to give serious attention to the preservation and development of the highroads. It cannot be said that Chile's highroads are adequate to the demands of her production and industry, but the efforts of the State to improve them are continuous, and have not been without result. There are about 25,000 miles of road in the republic, and they exhibit peculiarities varying according to the country which they traverse. Thus, in the provinces of Tarapacá and Antofagasta, and in part of Atacama, with few exceptions the roads serve to connect the mining centres with the principal

towns. As in these regions it rarely or never rains, the plains and deserts are marked by the tracks of droves of beasts. Very few people know these paths, and it is necessary for the traveller to engage guides if he does not wish to lose his way.

In the central region, where rain abounds and there is an infinity of little streams, the roads require special planning, and bridges and drainage are necessary. Agriculture being the principal industry, and the lands which the roads traverse being cultivated, it is imperative that these means of communication should be constantly under construction and kept in good repair.

In the southern region, and especially in the provinces of Valdivia, Llanquihue, and Chiloé, where the rains are very copious and the nature of the soil is unfavourable, impassable marshes are quickly formed in winter, rendering necessary in many districts the construction of *planchados*, or plank roads, similar to those in some parts of the United States.

'Mountain roads' are those which carry the traffic with neighbouring countries through the gaps in the Andes Cordillera. These roads play a very important part for the driving of sheep to and from the pasture lands, and in the cattle trade existing along almost the entire line of the Argentine frontier.

The numerous streams and lakes, navigable for

small craft, which occur in the territory of the republic, are in the nature of highways which facilitate communication between the cities of the interior, and afford transport to the coast for their products. These means of communication are found in the provinces from Maule to Llanquihue, and we have alluded to them in another chapter. With particular reference to small-craft navigation we may mention here that the river Maule is navigable for 74 miles, from its mouth to San Javier de Loncomilla, and even further for flat-bottomed launches, rowed or towed, with 14 or 15 tons of cargo. The river Itata is navigable in the same way, in certain seasons of the year. The Bio-Bio can be navigated as far as 90 miles from its mouth ; the Paicaví, in the province of Arauco, is navigable for 16 miles, and the Lebu for a mile and a quarter. Lakes Lanalhue and Lleu-lleu, 17 and 18 miles respectively in length, are also navigable. The river Vergara, in the province of Bio-Bio, is navigable for 9 miles. The large river Imperial, in the province of Cautín, can be navigated during the winter between Carahue and Nueva Imperial, a distance of 14 miles, and the river Cholchol; from that city to the town of the same name, or over 23 miles. The river Moncul is navigable for 15 miles, as far as the Lake of Trovolhue.

In the province of Valdivia and in part of Llanquihue there is a thorough system of navigation by

means of little vessels of 25 to 30 tons, the rivers being more utilized than the roads. The affluents of the river Valdivia alone represent nearly 125 miles of navigable ways. In this province, and in that of Llanquihue; the river Bueno, which serves as a boundary between them, facilitates the exportation of their agricultural and industrial products from the departments of La Unión and Osorno. The river Rahue is navigable from the last-named city to its confluence with the Bueno near Trumao, a distance of 28 miles.

The river Negro is navigable for 15 miles, from Osorno to the township of Negro, and, finally, the great river Maullin can be navigated for the same distance from its mouth.

The numerous rivers and lakes of this vast region, and of that which extends farther south and is still uninhabited, will undoubtedly, in the future, be among the principal factors in its development and of its wealth.

Urban and suburban communications in the chief cities of Chile are effected by means of tramways, which are propelled by electricity or by horse-power. These lines have a total length of 186 miles, and carry during the year not less than 120,000,000 passengers, for 75,000,000 of which Santiago is responsible.

The majority of the telegraph lines in Chile form, like the posts and railways, part of the industrial

services of the State. In the telegraph service the Government's object is to favour general interests, and to this end it carries wires to, and establishes offices in, places where no private undertaking would find it profitable to maintain them. In this way the telegraph system of the State has been extended until it permits of communication between the most distant and out-of-the-way cities and towns, from Tacna to Chiloé, at moderate and uniform tariffs. At the present time there are 9,400 miles of national telegraph lines in existence, without reckoning those which belong to the railways.

Local telegraph lines are of less importance ; chief among them is that which belongs to the Commercial Telegraph Company.

It should be mentioned, with reference to the international telegraph lines, that the State system is connected with the Argentine lines via Mendoza, with Bolivia via Antofagasta and Tacna, and with Perú via Sama. The special line from Punta Arenas to the eastern entrance of the Strait of Magallanes connects at the latter point with the Argentine national lines, and the telegraphic service with the rest of the continent and the outside world is in the hands of the West Coast of America Telegraph Co. Ltd., and the Central and South American Telegraph Company, via Colón.

The principal cities of Chile also possess telephonic

services, which, however, do not belong to the State. Not less than 8,700 miles of wire are in operation, some of the lines traversing great distances. The principal telephone concern is the Chile Telephone Company, which has a capital of £300,000.

The postal system of Chile forms part of the Universal Postal Union, and has established all the services recognized by the various international conventions entered into up to the time of writing. There are more than 1,000 post-offices, and the annual movement amounts to 78,000,000 pieces of mail matter.

CHAPTER XIV

NAVIGATION

THE geographical situation of Chile gives it advantages which no other South American country can boast for the development of shipping enterprises. The great length of its coasts, and the comparative proximity of the ports to the producing centres of the interior, facilitate communications by means of the sea, which for Chile is the natural transport-route between the various parts of the territory.

At the present day there are nearly a score of ports open to international commerce and twice that number intended for coastwise trade. They have an annual exterior commerce movement of £46,973,400 and a coastwise trade movement of £20,275,650, carried by vessels representing 18,334,000 tons and 33,771,000 tons respectively. It is easy to understand, from these figures, that maritime navigation exercises a direct influence upon the economic prosperity of the country.

As soon as the first Government independent of the Spanish metropolis was organized, the ports of

Chile, as we have said, were opened to the commerce of all nations. Among the first vessels to arrive, as a result of this opening of Chilean harbours, history records the name of the frigate *Galloway* from New York. She anchored in Valparaiso at the beginning of November 1811, bringing the first printing-press and the American printers Johnson, Burbidge and Garrison, who produced in Santiago, for the Government and under the direction of the ecclesiastic Camilo Henriquez, the first Chilean periodical, *La Aurora de Chile*.

Valparaiso, Talcahuano, and Coquimbo were at that time the ports for foreign trade, and upon the attainment of national independence their maritime traffic commenced materially to increase. For instance, from 1817 to 1822 the number of vessels entering Valparaiso was 523.

Chilean capitalists, assisted to some extent by the advantages which the laws conceded to national vessels in the coastwise trade, and especially by the exemptions which the Government granted to them, formed in 1819 a company with a capital of \$104,000, for direct trade with India, and although this attempt ended unfavourably, it demonstrates the progressive spirit which at that time animated the men of the country.

Thanks to a good Government, external commerce and the mercantile marine developed rapidly. Val-

paraíso, the principal centre of mercantile transactions, had considerably augmented its population and could count, in 1822, nearly 15,000 inhabitants. As a rule no less than 60 vessels were anchored in the port. At this period the national merchant marine was composed of 40 fair-sized vessels, engaged, for the most part, in the coastwise traffic.

With the recovery from the political upheavals which preceded the definitive organization of the republic, external commerce and navigation attained a more considerable development. In 1834 the trade of the port of Valparaíso, representing 80 per cent. of the total traffic, was carried by 134 national and 260 foreign vessels. The Chilean marine at that time consisted of 57 ships.

In 1835 Congress conceded to the North American citizen, William Wheelright, the privilege of carrying on the coastwise traffic, for ten years, by means of steam-navigation. This concession enabled a company to be formed in London to conduct the daring enterprise.

To appreciate the importance to which the execution of this project was destined to attain, it must be remembered how backward was the state of navigation at the time. On October 15, 1840, there arrived in Valparaíso, via the Strait of Magallanes, two vessels, the *Chile* and the *Parú*,

each of 700 tons, and thus was inaugurated steam-navigation in this part of the continent.

The company formed in England by Wheelright, which was named the Pacific Steam Navigation Company, had to contend, in its development, with many difficulties, not the least of which was the lack of coal ; but the deposits in the south of the country were explored, and the favourable results obtained gave rise to an important industry.

The mercantile marine at this period progressed but slowly. Nevertheless, in 1849, as a result of the discoveries of gold in California, it comprised 119 vessels, of which 42, with a total of 3,739 tons, had been built in the country.

In 1853 the English company possessed four vessels, and in consideration of a subsidy of \$36,000 granted by the Government it extended its operations into the southern seas. In 1858 a fresh subsidy permitted of the extension of its navigation as far as Puerto Montt, and two years later it established a weekly service between Valparaiso and Callao, thus greatly assisting and increasing commercial relations with Perú.

In 1864 the first shipping company with Chilean capital was formed. The English concern had meanwhile advanced until it was in a position to realize in all its amplitude the project of its founder, and in 1867 it established a monthly line of vessels

between Valparaiso and Liverpool, via the Strait of Magallanes. Thus Wheelright's concern not only facilitated communication with the countries of the east coast of America, but also brought Chile nearer Europe, by reducing by two-thirds the time usually occupied by sailing vessels obliged to follow the longer Cape Horn route. The prosperity of the company was thenceforth assured, and the enterprise which began so modestly came to be one of the most powerful in the world. The Pacific Steam Navigation Company is now amalgamated with the Royal Mail Steamship Company, having been purchased by the latter for the sum of £2,000,000.

In 1870 Chilean capitalists formed a new steamship company, which subsequently operated in conjunction with the existing concern, the two composing the *Compañía Sud-Americana de Vapores*, with a capital of \$2,500,000. This company, subsidized by the Government with \$100,000, extended its navigation as far as Panamá.

Shortly before the war with Perú the mercantile marine of Chile possessed a total tonnage of 39,700 tons. This figure was considerably reduced during the war, but afterwards it again increased rapidly. In 1889, for example, it comprised 150 sailing vessels with a total of 65,700 tons, and 29 steamships with 18,800 tons.

As external commerce developed foreign shipping

became more and more important, and among the oldest of the concerns which carry on the coastwise traffic is the German 'Kosmos' line, which was initiated in 1870.

From the history of Chilean maritime navigation we may now turn to the study of the present importance and condition of the shipping industry. The transport service in Chile is in the hands of private native companies and shipowners and of agencies of foreign companies and shipowners. The native companies possess a total of 52 vessels with an aggregate registered tonnage of 48,200 tons, the most important of these concerns being the above-mentioned *Compañía Sud-Americana de Vapores*, which has a fleet of 21 vessels with a total tonnage of 28,900 tons and an estimated value of £1,250,000. This company at present maintains the following lines with a fortnightly service: Valparaiso to Panamá, 3,205 miles; Valparaiso to Eten, 1,960 miles; Valparaiso to Junín, 1,750 miles; Valparaiso to Puerto Montt, 1,362 miles; Valparaiso and Chiloé Channels, 1,740 miles. It also has a service of river-boats on the Maule, Imperial, Valdivia, Rio Bueno, and Maullin.

The shipping firm of Braun and Blanchard of Punta Arenas maintains a line between that port and Valparaiso.

The merchant sailing vessels belonging to native shipowners amount to 41, with a total of more than

22,000 tons. The most important firm is the *Compañía Nacional de Maderas y Buques*, of Valparaiso, which owns 15 sailing vessels with a total tonnage of 15,989 tons, engaged in the freighting of native timbers and in importation from abroad. Several shipowners of Valparaiso, Talcahuano, and Punta Arenas are engaged in whale fishing, the *Compañía Chilena de Balleneros*, of the first-named port, being the chief of these.

The foreign shipping companies which carry on the coastwise and external trade are the following :—

The Pacific Steam Navigation Company, now amalgamated with the Royal Mail Steamship Company. It maintains on the line from Valparaiso to Liverpool 15 vessels with a total of 46,600 tons, and on the line along the coast to Panamá 12 vessels with a total of 21,380 tons.

The *Compañía Alemana de Vapores Kosmos*, which runs a line of steamships from Hamburg to Callao and another to Vancouver in British Columbia, with a fleet of 42 vessels (117,000 tons).

The West Coast Line, belonging to various English and North American shipowners, conducts a service of cargo-boats between England, New York, and the ports of Chile (10 vessels, 21,000 tons).

The Merchants' Line, belonging to various English shipowners, with 7 vessels (45,000 tons) plying between the same ports.

The Gulf Line, belonging to the firm of F. W. Ritson of Sunderland, which owns 8 vessels (20,000 tons).

The Lamport & Holt Line, with 8 vessels (50,000 tons).

The Roland Line, the property of various Bremen shipowners, with 7 vessels (35,000 tons), and

The Toyo Kisen Kaisha, a Japanese shipping company with services between Hong-Kong, Japan, Mexico, and Chile.

There are also many vessels belonging to foreign shipowners which carry on traffic between the ports of Europe and Chile. Foreign shipping employs over 60 sailing vessels, with an approximate total of 100,000 tons.

The following figures, taken from the latest statistics, will permit of an appreciation of the present importance of the shipping industry :—

EXTERNAL MARITIME MOVEMENT

		<i>Tonnage</i>
Steamships entered	3,284	9,205,000
Sailing vessels entered	478	905,000
Steamships cleared	2,653	7,442,000
Sailing vessels cleared	438	782,000

COASTWISE MOVEMENT

Steamships entered	10,464	15,645,000
Sailing vessels entered	472	408,000
Steamships cleared	11,053	17,236,000
Sailing vessels cleared	505	480,000

The total tonnage of the vessels engaged in the coastwise traffic which entered Chilean ports is 16,053,000 tons, and that of the vessels which cleared, 17,717,000. The total movement of external and coastwise navigation is represented by 26,164,000 tons entered and 25,942,000 tons cleared, or a total maritime traffic of 52,106,000 tons.

The share of each of the principal nations in this traffic is seen from the following figures, which show the entries and clearances of all the ports of Chile in 1910 :—

	<i>Tons</i>
English	24,720,000
German	11,997,000
Chilean	11,921,000

French, Norwegian, Italian, and Japanese figure to a much smaller extent. The proportion of vessels flying the Chilean flag is 23 per cent. or nearly a quarter of the total movement.

When it is remembered that ten years ago the total shipping movement was 22,353,000 tons, and that last year's figures compared with those of 1901 show an increase of 133 per cent., it is obvious that the industry has an important share in the commercial activity of the country.

Such an augmentation of traffic has brought in its train the necessity for various reforms, and amongst these the improvement of the vessels

and of the conditions of the ports are the most urgent.

At the present time Chile's navigation laws are most liberally framed. In Chilean ports foreign vessels can carry on the traffic of importation, exportation, and the coasting trade under the same conditions as the native vessels. There is no tax on the shipping other than a very moderate one collected once a year to cover the cost of the light-house service. The vessels of the firms and companies which have regular lines established between Chilean ports enjoy the packet privileges and are granted facilities of every description for the lading and discharge of cargo. Finally, foreign vessels are at liberty to engage crews in Chile.

To stimulate the service the State grants large subsidies to several native companies and for a long time has subsidized the Pacific Steam Navigation Company for the mail to Europe.

The necessity for maintaining direct relations with the ports of the Atlantic and with the markets of the Mediterranean is now recognized, and a scheme designed to interest foreign companies in the establishment of new steamship lines is being studied.

The organization and direction of the shipping services is under the charge of the superior authorities of the National Fleet. The littoral is divided into maritime 'governments' whose head-quarters,

from north to south, are situated in the following ports: Arica, Iquique, Antofagasta, Caldera, Coquimbo, Valparaiso, Constitución, Talcahuano, Corral, Puerto Montt, Ancud, and Punta Arenas. These 'governments' are subdivided into sub-delegations, to whose officials is entrusted the inspection of shipping and the protection and assisting of vessels. In places where the conditions of the ports render their services necessary there are skilful pilots.

The service of lighting and buoying the coast was inaugurated in Chile in the year 1837. There are 50 lighthouses, of which 4 are of the first class, 2 of the second, 3 of the third, 16 of the fourth, and 25 of the sixth class. Thirty-one of these lighthouses are in the form of towers, and nearly all of them are connected with the head-quarters of the maritime authorities by means of telegraph lines.

The Hydrographic Bureau, created in 1874, directs coastal exploration and the publication of charts. It also issues the *Hydrographic Annual of the Chilean Navy*, which for some years has been considered one of the best works of its kind.

CHAPTER XV

TRADE AND COMMERCE

THE configuration of the coast, throughout its length, exhibits no extensive bays other than those of Valparaiso and Talcahuano in the centre, Mejillones and Coquimbo in the north, and Arauco and Ancud in the south, of which some are sheltered while others are exposed to certain winds ; but in addition to the gulfs and estuaries of the southern region there are numerous creeks which are largely used for commercial traffic. In the navigable rivers there are other ports, but of minor significance, and, lastly, the Andes Cordillera, which serves as an international frontier line with Argentina and Bolivia, has numerous passes or gaps, some of which are adapted to commercial transit.

From the administrative point of view there are major ports, minor ports, and frontier customs stations. The first named are those which are open to international commerce, the second serve for internal traffic, and the last-named deal with trade of all kinds.

There are in Chile 15 major ports and 38 minor ports for maritime trade ; one major port and 6 minor ports for fluvial commerce, and 39 frontier customs

stations. It may be estimated that the commerce of the maritime ports represents 90 per cent. of the total movement, and that of the remainder 7 per cent. correspond to the land port trade and 3 per cent. to the fluvial commerce.

From the point of view of the economic activity of the several regions of the country the relative importance of the principal ports is as follows:—

In the north, the nitrate and mining region, Iquique and Antofagasta.

In the centre, the agricultural and industrial region, Valparaiso and Talcahuano, and

In the south, the agricultural, forest, and cattle-raising region, Valdivia and Punta Arenas.

A general idea of the activity of the principal ports may be gained from the following figures showing the cargo-movement of each during 1910:—

	<i>Tons</i>		<i>Tons</i>
Valparaiso . . .	1,483,567	Coronel . . .	262,412
Iquique . . .	1,158,277	Caleta Coloso . .	212,364
Antofagasta . .	808,718	Lota . . .	194,073
Taltal . . .	454,929	Pisagua . . .	182,549
Mejillones . . .	429,281	Coquimbo . . .	154,000
Caleta Buena . .	366,343	Punta Arenas . .	139,026
Talcahuano . . .	339,555	Valdivia . . .	136,171
Tocopilla . . .	310,174		

The total cargo-movement of last year amounted to 7,411,750 tons, of which 4,042,112 tons were cargo shipped and 3,369,638 tons were cargo discharged.

It is easy to understand that Chile, with her long coast and numerous ports, the majority of which are unfavourably situated geographically, must give serious attention to their improvement by means of adequate hydraulic works. As a matter of fact, although up to the present little has been actually accomplished, the Government has schemes prepared for the improvement of the principal ports and, by a law recently enacted, will shortly carry out the projected works for Valparaiso and San Antonio, at a cost of £2,250,000 for the first and £750,000 for the latter.

To appreciate as a whole the advance of the external commerce of Chile and its progressive increase it will suffice to study the following table, which gives the figures for the first year for which statistics were compiled and those for the end of each subsequent decade :—

<i>Imports and Exports</i>		<i>Imports and Exports</i>	
1844 . . .	£2,922,600	1880 . . .	£16,362,200
1850 . . .	4,842,280	1890 . . .	21,464,000
1860 . . .	9,524,400	1900 . . .	22,119,100
1870 . . .	11,039,800	1910 . . .	46,973,400

A no less remarkable development is apparent in the coastwise trade, as to which, for the sake of brevity, we will merely state that in 1844 it amounted to £1,030,700 and in 1910 to £20,280,700.

Expressed in customs-house values the external

commerce of Chile amounted in 1910 to £46,973,465, of which £22,311,427 represented imports and £24,662,038 was for exports. The total imports were made up as follows :—

<i>Textile Materials and Manufactures</i>	£5,983,116
Cotton goods	£2,967,335
Jute and hemp goods, including sacks	839,527
Woollen goods	1,447,815
Silk goods	249,326
Linen goods	92,081
<i>Mineral Materials</i>	3,868,179
Iron and steel goods	2,515,631
Earthy substances, cement, glass, and porcelain	765,766
<i>Industrial Oils and Combustibles</i>	3,858,558
Coal	2,142,180
Crude Petroleum (from Perú)	875,311
<i>Vegetable Materials</i>	2,435,816
Rice, sugar, oil, coffee, and tea	1,358,214
<i>Machinery and Tools</i>	1,954,700
Fabrile	924,788
Agricultural	417,378
Mining	190,340
Locomotive	193,164
Scientific Apparatus	196,675
<i>Animal Products</i>	1,878,578
Live horned cattle	1,052,032
<i>Paper and Cardboard</i>	690,586
Printing paper	335,055
Forward	£20,669,533

	Forward	£20,669,533
<i>Liquors</i>		530,953
Whisky, gin, and brandy	182,214	
<i>Chemical Products, Perfumery, and Drugs</i>		479,909
Chemical products	149,638	
Drugs	224,840	
<i>Arms, Ammunition, and Explosives</i>		328,456
Dynamite	136,390	
<i>Miscellaneous</i>		302,576
		<u>£22,311,427</u>

This rapid enumeration of the principal articles of Chilean importation gives an idea of the nature of the necessities for the supply of which the country relies upon foreign industries, and of the openings afforded by internal consumption for the creation of new factories or workshops.

The values which correspond to each of the branches of the national export trade are as follows:—

Mineral Products	£20,185,137
Animal Products	1,813,077
Vegetable Products	1,659,149
Liquors	13,270
Miscellaneous	120,376
Nationalized goods	871,029
	<u>£24,662,038</u>

In the first of these classifications nitrate figures

with a value of £17,675,006, constituting, of itself, nearly three-fourths of the total exportation of the country. After nitrate, copper is the most valuable mineral product of Chile, and in 1910 there were exported: copper in bars, &c., £1,073,890; copper ore, £480,747; copper and gold ores, £48,477. Among other mineral products exported were iodine, £512,387; and borate, £351,497.

Of the animal products exported the following are the principal items: horses and mules, £56,578; food-stuffs, £37,788; industrial products, £641,534. Honey represents about two-thirds of the food-stuff exports. Among the industrial products there are raw hides, £246,954; sole leather, £193,915; chinchilla skins, £86,399; wool (ordinary, merino, and 'mestiza'), £122,208; wax, £26,494; and whale-oil, £7,937.

In the exportation of vegetable products grains, fruits, and garden-stuff constitute the chief part, their value amounting to £1,420,740. Food-stuffs represent £156,889, and industrial products £43,926. The exports of wheat were £504,401, and of flour £133,172; oats were exported to the value of £252,040, and the exports of barley and clover-seed amounted to £161,661 and £45,074 respectively. Beans accounted for £89,713, and vetches for £33,423. Amongst the fruits nuts represent £99,395, and of the other products exported quillay bark, used as

a detergent, was worth £39,734, pressed hay (silo) £17,718, and locust-beans £17,180.

In the category of miscellaneous products is blasting powder, exported to the value of £66,677.

The products of animal and vegetable origin exported in bulk as the raw material for foreign industries, and amongst which are reckoned hides and wool, represent a value of approximately £750,000. If to this sum be added the value of some of the mineral products, such as, for instance, copper, it is easy to estimate the importance of many elements of national production in the development of the manufacturing industries which use these materials, when foreign capitalists decide to import their enterprise and energy into a country which offers so many opportunities as Chile.

The very liberal policy that the first Government of the republic inaugurated, and which has been maintained to the present day, has undoubtedly acted as a powerful stimulus to the extension of trade with foreign countries and of the shipping industry between them and Chile. We have already seen the part played by the principal nations in the maritime traffic, and to complete this chapter on the commercial relations of the country the following table, which shows the value of the merchandise imported and exported in 1910 accord-

ing to the country of origin and destination, is appropriate:—

	<i>Imports</i>	<i>Exports</i>
Great Britain . . .	£7,056,277	£9,869,010
Germany . . .	£5,403,300	£4,831,223
United States . . .	£2,747,212	£5,080,230
France . . .	£1,440,600	£1,124,385

In the import trade the Argentine Republic follows with £1,125,000, next in importance being: Perú, £1,119,000; India, £825,000; Italy, £663,225; Australia, £558,975; Belgium, £506,475; and Spain, £256,725.

In the export trade the next most important countries are: Belgium, £715,575; Holland, £504,600; Bolivia, £460,650; Spain, £409,875; Argentina, £350,250; Cape Colony, £297,525; and Perú, £249,375.

CHAPTER XVI

MINING AND METALLURGY

COPPER and nitrate are the two mineral products which have made the name of Chile universally known.

The exploitation of copper began early in the seventeenth century, and the ore extracted from the mines of Coquimbo was sufficient to satisfy the needs of local consumption and to supply the demand of the vice-royalty of Perú, where it was principally used in the casting of ordnance.

In the eighteenth century copper-mining spread to the provinces of Atacama and Aconcagua, and at the beginning of the nineteenth century so many mines were in operation that the Chilean industry became the most important in the world. In that period the output of copper did not exceed 1,500 tons of metal a year, but in the course of time it increased until in 1853 it amounted to 15,000 tons. In 1876 the production was 52,308 tons, a figure which marks the maximum attained by Chilean copper production.

Until the end of 1882 this country occupied first

place amongst copper-producing countries, but from that date the United States and other countries began to produce on a large scale, surpassing the Chilean yield, which remained in the neighbourhood of 42,000 tons of fine copper annually.

The most detailed statistics available with respect to the production of copper from the commencement of the working of this mineral to the end of 1909 give a total of 2,207,908 tons with a value of £135,324,092.

It is to be noted that copper mining in Chile has not shared the development brought about in other countries by the exhaustion of relatively high-grade ores, and the almost complete failure to exploit and treat the enormous quantities of low-grade ore, which is precisely what constitutes the real source of production in nearly all other countries, is also to be remarked. It is computed that more than half of the world's total output of copper comes from ores of grades often inferior to 4 per cent., whereas in Chile, until quite recently, the extraction of 6 to 8 per cent. ores did not pay. In the last few years the attention of capitalists has been directed to this position of the industry, and in several modern plants low-grade ores are now being treated.

The present progress of copper-mining, according to the latest mining statistics, may be considered satisfactory, even though modern installations, well equipped with machinery, are rare. Enterprises on

a small scale, however, tend to disappear, and in their place are rising large and important establishments. It may be expected, therefore, that in a few more years the output of copper will increase appreciably.

An idea of the present position of the industry may be gained from the circumstance that to produce 500,531 tons of ore of a grade of 9.22 per cent., 800 mines have been in operation. Of these there are 75 whose annual production is above 500 tons, and together they contribute three-fifths of the total output, 200,000 tons being shared by the remaining 725 enterprises, which gives to each an output of less than one ton a day.

The tendency is, as we have said, towards production on a large scale, but the movement is still slow and will only assume real importance in future years. As an example of what is being done in this direction we may first cite the Braden Copper Co.'s establishment in Teniente, to the south of Santiago, where a plant has been erected with a capacity for treating daily 3,000 tons of ore of which the grade is sometimes as low as $1\frac{1}{2}$ per cent. This concern alone, in 350 working days, could treat in a year 1,000,000 tons of mineral, which at an average grade of 2 per cent. would mean an annual production of 20,000 tons of fine copper. The French Naltahua Company, already in operation, could work up or treat 400 tons

a day of $3\frac{1}{2}$ per cent. ores. The Las Condes and Volcan concerns, in the neighbourhood of Santiago, are, with others, about to increase their production, and the Catemú company is preparing to take advantage of the abundance of ores which it possesses, and which at present are not exploited for lack of certain smelting facilities.

The region of Coquimbo will also see its production increased through the utilization of the great quantities of poor oxidized ores which exist therein, and which are to be treated in the lixiviation works erected by the Sociedad Chilena de Fundiciones (Chilean Smelting Co.). The mining centres of Vallenar, Freirina, Copiapó, Chañaral, Antofagasta, Tocopilla and Tarapacá, in which last is the famous Collahuasi mine, likewise promise a considerably increased yield.

The production of Collahuasi comes almost exclusively from two large concerns, the *Poderosa*, acquired by English capitalists, and the *Grande*. It amounts to 13,000 tons, which represents approximately one-third of all the copper produced in the country.

The smelting of ores is the principal system of treatment, and in this direction decided progress can be noted, principally manifested by the abandonment of the old-style small reverberatory furnaces and the substitution for them of cupola furnaces

in plants of greater capacity, and by the increased employment of converters.

During the year 1909 some thirty smelting works were in operation, two of which dealt with over 40,000 tons. In the same year the Guayacán works produced 7,620 tons of bar copper, the Lota concern 4,831 tons, the Gatico establishment 1,877 tons, and the Catemú works 1,859 tons.

The statistics of the output of fine copper in 1909 are as follows :—

	<i>Tons</i>
Bar and ingot copper	19,377
Copper regulus	3,930
Copper ores	18,726

Argentiferous and auriferous regulus was also produced, and copper and gold ores were exported.

The total output of fine copper amounted to 42,726 tons, of an estimated value of £1,985,775.

In addition to copper, silver, gold and lead are mined in Chile, and of late the iron ores of exceptional quality which occur in great abundance in the country have been exploited.

Silver mining began in Chile towards the end of the seventeenth century, and was continued on a small scale throughout the eighteenth ; but in the first quarter of the nineteenth century the production reached about 20 tons annually. From 1830 to 1845 it increased to nearly 35 tons, thanks to the discovery

of the famous Chañarcillo mine and, subsequently, of many others, which ushered in an era of prosperity for Chilean mining.

From 1845 to 1855 the output attained the high figure of 213 tons, but from the latter date it began to decline. In 1887, however, following the discovery of further deposits of ore, it recovered and reached 220,183 tons.

The total production of silver from 1692 to the end of 1907 is computed at 8,093 tons, with a value of £57,522,026. If to this be added the yield of the Caracoles mine, which formerly belonged to Bolivia but which was operated by Chilean capital and Chilean miners, and was supplied, furthermore, with provisions and materials from Chile, the aggregate amounts to 8,948 tons, with a value of £63,734,611. In 1908 the production of fine silver was over 43 tons, valued at £112,500.

Broadly speaking, the production of silver, or rather the working of the silver mines, is a decadent industry. Important mines are, however, carried on in Tarapacá and other provinces, the principal centre of production being for the present the department of Taltal.

Seeing that the majority of the silver mines are situated amongst calcareous rocks it is remarkable that the calcination process is not adopted for smelting with copper ores to produce argentiferous regulus, which would be easily marketable in Europe.

Silver metallurgy suffers from the decadence of the ore production, but efforts are being made to apply lixiviation to silver ores. At present the most important establishments are the Huantajaya, in Tarapacá, and those of Taltal and Coquimbo.

Statistics for 1909 give the following production of bar silver and silver ores in fine metal :—

	<i>Tons</i>
Bar silver	10.294
Silver ores	2.854
Silver-gold ores	3.515
Silver-gold-copper ores	3.305

Add to this the silver contained in the copper exported, and the total production amounts to just under 36 tons, with a value of £77,925.

Gold was mined in Chile in pre-conquest days. The *conquistadores* established works in the placers which they succeeded in discovering, and it is estimated that the annual production in the first few years was not less than 60,000 ounces, the yield subsequently declining. During the seventeenth century the production appears to have been insignificant, and to have remained so until the following century, when the first veins of ore were discovered in Copiapó, and later in Lampagui, Illapel, and other places, giving rise to gold metallurgy. Towards the end of the eighteenth century the yield again reached some 60,000 ounces yearly; at that time the

ore deposits of Inca, Chamonate, Atacama, Andacollo, Bronce, Llahuin, Hierro Viejo, Las Vacas, Catemú, and many others were exploited whose present state of decay is noteworthy. Early in the nineteenth century the production reached its highest point with 93,336 ounces, but later on it recommenced to decrease, owing chiefly to the greater interest aroused by the discoveries of rich mines of silver and copper. Another reason was the difficulty of working the ores, which increased with their distance below the surface, and the system of amalgamation employed, which only yielded a small proportion of the gold contained in the pyrites, while these ores occur always at a greater or lesser depth. The exploitation of new placers in Magallanes and the occasional discovery of new veins have since then somewhat raised the importance of gold-mining in Chile, and the establishment of plants for cyanide treatment also promises well for this branch of national industry.

The total production of gold from the epoch of the Spanish conquest up to the end of 1909 is estimated at 9,639,724 ounces, with a value of £45,806,100.

Gold-mining, in the last few years, has declined considerably, for the fine gold produced in 1909 amounted only to 1,603 ounces, as against 12,952 ounces six years previously, that is in 1903. There are many gold mines which are not worked because

the treatment of the ores requires special plant according to their nature, and also would necessitate the investment of capital which is used to better advantage and with less risk in other industries. This state of affairs has effected a stoppage of numerous plants.

However, the recent discovery in the Constitución district may, if report speaks true, do much to revive the industry. It is said that in September of the present year a *peon*, having purchased the foundations of an old house, found amongst the fallen masonry a stone which contained a considerable quantity of gold. Learning that the stones originally came from a neighbouring hill he investigated the site, with the result that, within a week, gold to the value of £15,000 was extracted from the soft quartz matrix in which it occurs. A company has been formed to exploit the deposit, and at the time of writing the find has created a species of 'gold rush'.

As to gold placers, although they also have entered upon a period of decadence they are still of considerable importance. In Coquimbo the Andacollo placers produced, in 1909, nearly 1,600 ounces, obtained entirely by individual labour, without machinery installations of any kind. In the central provinces the oldest and best-known placers now yield but a small output, but in the Magallanes

territory the production in 1909 amounted to 820 ounces of fine gold.

The total production of gold during the year 1909, and the substances which contain it or the form in which it was produced, are as follows :—

Gold ingots, gold-dust, and *piñas*¹ from:

placers	5,760 oz.
Gold ingots and <i>piñas</i> from mines	1,158 „
Gold ores	285 „
Gold-silver ores	1,230 „
Gold-silver-copper ores	1,160 „
Gold-copper ores	10,213 „

If to these figures we add the bars and ingots of copper with gold, the ores of ordinary copper, the 'eyes' of auriferous and argentiferous copper, and other products, we arrive at a total production of 40,695 ounces, with a value of £88,170. Of this output, however, gold of commercial value only amounts to 21,848 ounces of fine.

The output of lead, manganese, and cobalt is insignificant.

In 1910 was started the exploitation of the rich iron mine *El Tofo*, in Coquimbo, which belongs to the French iron prospecting company that established blast furnaces at Corral, Valdivia, for the smelting of ingots. The exportation to England of 65 per cent. ferruginous ores free from undesirable substances has also been commenced.

¹ A *piña* is a mass of gold of pineapple shape.

Chile's wealth in iron ores is fabulous, and when it is better known it will attract much attention in the metallurgical centres of Europe.

Nitrate constitutes the most important of Chile's mineral products. From the time when the Tarapacá and Antofagasta territories passed into the possession of Chile the nitrate industry made great strides; the output, which in 1879 was approximately 60,000 tons, increased ten years later to 950,000 and now reaches 2,350,000, with a customs house value of £17,675,006. But this enormous development has only been attained within the last ten years, during which time an intelligently conducted propaganda has succeeded in making known, in a scientific and practical form, the advantages accruing from the use of nitrate as a nitrogenous fertilizer in agriculture.

Nitrate, as is well known, is extracted from the saline deposits which exist in immense abundance in the province of Tarapacá and Antofagasta, where they form layers of varying thickness. It occurs as a rule mixed with other salts, from which it has to be separated. The raw material, known as *caliche*, is treated in large establishments by means of a solution-and-evaporation process. Some of the factories, or *oficinas*, produce as much as 250,000 tons of nitrate annually.

In 1910 there were in operation 108 *oficinas*, which

employed 25,000 hands. Many of these factories belong to English trading companies.

Nearly one-half of the nitrate produced in Chile is exported directly to England, and only one-quarter to Germany. The remainder goes to various countries, particularly Belgium.

The principal ports for export are Iquique, Caleta Buena and Pisagua, in the province of Tarapacá ; and Antofagasta, Taltal, Tocopilla and Mejillones in the province of Antofagasta, which exports slightly more than that of Tarapacá.

Iodium, in restricted quantities, is extracted from the liquid solution of the nitrate deposits. The amount is limited to maintain the market price.

The total production of nitrate in Chile from 1878 to 1909 was 33,060,182 tons, of which the value is estimated at £235,433,071. The total output of iodine in the same period was 8,975 tons, worth £9,511,713.

In addition to nitrate and iodine many other mineral substances are exploited, among which coal, natural borates, guano, sulphur, and common salt are worthy of mention.

Coal mining is assured of a great future in Chile, which possesses a very extensive carboniferous zone, but up to the present it is a source of wealth which has not been exploited on a very large scale. The present output amounts to about 1,000,000 tons

a year, and it is computed that from 1840 to 1909 the production was 26,617,574 tons, with a value of £22,402,910.

The mining statistics for 1909 give the following *résumé*, which demonstrates the importance of this branch of national production :—

	<i>Output</i>	<i>Value</i>
Copper	42,726 tons	£1,985,814
Gold	40,695 ounces	88,168
Silver	1,420,735 „	77,932
Coal	898,971 tons	876,497
Nitrate	2,101,512 „	13,135,253
Iodine	474 „	417,889
Borate	32,218 „	342,790
Sulphur	4,507 „	40,569
Guano	10,692 „	31,879

The total value of the mineral production in Chile in 1909 is calculated at £19,583,912.

As may be seen, nitrate, with the iodine derived from it, is easily first in importance, far surpassing other sources of Chilean mineral wealth. Nitrate and iodine contribute to the State, in the shape of export duties, a sum which in 1910 amounted to £6,029,533. of which only £55,381 was paid on export of iodine.

CHAPTER XVII

MANUFACTURING INDUSTRIES

THE last twenty years, which mark an epoch of extraordinary progress for Chile, have seen the rapid development of a considerable number of manufacturing industries, whose importance has increased in proportion with the expansion of the various enterprises and the perfecting of the articles which they produce.

In 1909, according to the latest statistics, there were in Chile 5,321 industrial establishments, with an aggregate capital estimated to amount to £28,553,250. They gave occupation to 75,816 operatives, and employed 2,412 motors of various kinds and of a total force of 48,914 h.p. The wages of the operatives amounted to, approximately, \$67,689,282 or £5,076,696, and the value of the total output was calculated to be \$512,588,124 or £38,444,109. The various factories consumed during the year native raw material to the value of £13,780,486, and foreign raw material costing £7,655,293.

The most important group of industries is that which manufactures food-stuffs, and which comprises

776 establishments with a capital of \$122,478,000, or £9,185,850, and an output amounting in the aggregate to the equivalent of £15,064,875. Then come the industries connected with the preparation and utilization of hides and skins, with a capital of £3,842,475 and a production value of £5,625,000. The clothing and textile industries occupy third place, with a capital of £2,622,375 and an output of £4,125,000. In the fourth rank we may place the wood-working and furniture industries, with a capital of £2,684,025 and an output valued at £3,131,025. Next in order come the mechanical and metal-work industries, the manufacture of beverages, of chemical and pharmaceutical products, the printing and paper industries, the lighting industries, and others.

The industries which employ the greatest number of operatives are the textile and clothing factories, which give occupation to 13,400 work-people, and the tanneries and allied industries, which engage about as many. The manufacture of food-stuffs employs nearly 12,000, and that of wood-work and furniture 9,200. The mechanical and metal-work factories are carried on with somewhat less than 7,000 employees.

In the northern region of the country, where agricultural production is either very small or altogether lacking and where the energies of the population are concerned almost exclusively with

the exploitation of the nitrate and mineral resources, manufacturing industry, properly speaking, has developed but little.

From Aconcagua to the south the principal industry consists of the cultivation of the soil, which provides easily and in abundance food for the population and raw material for the manufactures. In this region, the site of the great cities and the centre of the country's economic activity, the manufacturing industries have flourished exceedingly in recent years, notwithstanding the obstacles that enterprise of this nature encounters in every new country which lacks a population educated to the industrial life and must struggle with a foreign competition supported by the advantages accruing from centuries of production.

The food-stuffs, clothing and furniture industries have for the most part been established, and have attained prosperity, in the vicinity of the great cities of the central region. The same may be said of the lighting, the mechanical, and of all the other industries which require a great number of hands. Flour-mills are found in the wheat zones, from Valparaiso to Osorno; in the principal ports are dockyards and shipyards; in the southern regions flourish the meat and fish preserving factories, the refrigerating establishments and the industries arising out of the deep-sea fisheries.

This rapid review of the Chilean industries permits of a proper appreciation of the state of this branch of national activity, and will serve as a basis upon which to judge of the importance which it may acquire in the future, assisted by the intelligent efforts of the race, the great advantages afforded by the geographical conditions of the several zones of the territory, and its wealth in natural elements. Chief among these latter are the large streams of water, easily utilizable for the generation of electrical power, the coal-mines, and the great abundance and variety of raw material, animal, vegetable, and mineral.

Chile, like perhaps no other South American country, possesses in the natural conditions and special qualities of its people an advantage which clearly indicates the course she should pursue and the direction in which she should employ her energies and her faculties. Though agriculture and mining have immense possibilities, Chile cannot aspire to be either especially agricultural or exclusively mineral. To develop to the utmost her economic life she must found her future on the wise utilization of the resources she possesses for transforming the raw materials of her soil, for supplying the national demand for manufactured articles, and for creating profitable relations with the neighbouring countries by providing them with commodities which at present they purchase from Europe or from the United States.

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